Scientific Excellence • Resource Protection & Conservation • Benefits for Canadians
Excellence scientifique • Protection et conservation des ressources • Bénéfices aux Canadiens

Cowichan River Assessment (1987): The Influence of River Discharge on Sidechannel Fish Habitats

T. Burns, E.A. Harding, and B.D. Tutty.

Department of Fisheries and Oceans
South Coast Division
Habitat Management Operations
3225 Stephenson Point Road
Nanaimo, British Columbia V9T 1K3

November 1988

Canadian Manuscript Report of Fisheries and Aquatic Sciences No. 1999

Fisheries and Oceans Pêches et Océans

Canada

89-04769/

Canadian Manuscript Report of Fisheries and Aquatic Sciences

Manuscript reports contain scientific and technical information that contributes to existing knowledge but which deals with national or regional problems. Distribution is restricted to institutions or individuals located in particular regions of Canada. However, no restriction is placed on subject matter, and the series reflects the broad interests and policies of the Department of Fisheries and Oceans, namely, fisheries and aquatic sciences.

Manuscript reports may be cited as full publications. The correct citation appears above the abstract of each report. Each report is abstracted in *Aquatic Sciences and Fisheries Abstracts* and indexed in the Department's annual index to scientific and technical publications.

Numbers 1–900 in this series were issued as Manuscript Reports (Biological Series) of the Biological Board of Canada, and subsequent to 1937 when the name of the Board was changed by Act of Parliament, as Manuscript Reports (Biological Series) of the Fisheries Research Board of Canada. Numbers 901–1425 were issued as Manuscript Reports of the Fisheries Research Board of Canada. Numbers 1426–1550 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Manuscript Reports. The current series name was changed with report number 1551.

Manuscript reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page. Out-of-stock reports will be supplied for a fee by commercial agents.

Rapport manuscrit canadien des sciences halieutiques et aquatiques

Les rapports manuscrits contiennent des renseignements scientifiques et techniques qui constituent une contribution aux connaissances actuelles, mais qui traitent de problèmes nationaux ou régionaux. La distribution en est limitée aux organismes et aux personnes de régions particulières du Canada. Il n'y a aucune restriction quant au sujet; de fait, la série reflète la vaste gamme des intérêts et des politiques du ministère des Pêches et des Océans, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports manuscrits peuvent être cités comme des publications complètes. Le titre exact paraît au-dessus du résumé de chaque rapport. Les rapports manuscrits sont résumés dans la revue *Résumés des sciences aquatiques et halieutiques*, et ils sont classés dans l'index annuel des publications scientifiques et techniques du Ministère.

Les numéros 1 à 900 de cette série ont été publiés à titre de manuscrits (série biologique) de l'Office de biologie du Canada, et après le changement de la désignation de cet organisme par décret du Parlement, en 1937, ont été classés comme manuscrits (série biologique) de l'Office des recherches sur les pêcheries du Canada. Les numéros 901 à 1425 ont été publiés à titre de rapports manuscrits de l'Office des recherches sur les pêcheries du Canada. Les numéros 1426 à 1550 sont parus à titre de rapports manuscrits du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 1551.

Les rapports manuscrits sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Canadian Manuscript Report of
Fisheries and Aquatic Sciences No. 1999
November, 1988.

Cowichan River Assessment (1987):
The Influence of River Discharge on Sidechannel Fish Habitats

by

T. Burns, E.A. Harding, and B.D. Tutty.

Department of Fisheries and Oceans,
South Coast Division,
Habitat Management Operations,
3225 Stephenson Point Road,
Nanaimo, British Columbia.
V9T 1K3

(C) Minister of Supply and Services Canada 1987.
Cat. No. Fs 97-4/1999E ISSN 0706-6473.

Correct citation for this publication:

Burns, T., E.A. Harding, and B.D. Tutty. *Cowichan River assessment (1987): The influence of river discharge on sidechannel fish habitats.* Can. MS Rep. Aquat. Sci. No. 1999: v + 24p.

Table of Contents

		page
Table of Contents		iii
List of Figures		iii
List of Tables		iii
Abstract		iv
Résumé		v
1.0	**Introduction**	**1**
2.0	**Methodology**	**4**
2.1	Study Plan	4
2.2	Preassessment	4
2.3	Field Assessment (1987)	6
3.0	**Results**	**9**
3.1	Active Sidechannels	9
3.1.1	Lower Active Sidechannels	10
3.1.2	Middle Active Sidechannels	10
3.1.3	Upper Middle Sidechannels	11
3.2	Flood Sidechannels	11
3.3	Back Sidechannels	11
3.4	Relic Sidechannels	12
4.0	**Discussion and Conclusions**	**13**
4.1	Sidechannels - General Discussion	13
4.2	Active Sidechannels	14
Bibliography and Acknowledgements		24

Appendix 1 - Sidechannel Assessment Summaries
Appendix 2 - Operating Rule Curve - Cowichan Lake weir
Appendix 3 - Cowichan L. weir discharge graphs (1982 to 1987)
Appendix 4 - Freshwater Life Cycles for Cowichan River Salmon

List of Figures

Figure I.	Location of the Cowichan watershed	2
Figure 2.	Cowichan watershed planimetric base map	3
Figure 3.	Sidechannel Catalogue	5
Figure 4.	Methodology for the measurement of Sidechannel Area	8
Figure 5.	Wetted Area / Discharge Comparison	21

List of Tables

Table 1	Cowichan River Sidechannel Classification Index (1987)	15
Table 2	Cowichan Sidechannels: Total Area Summaries	20

Abstract

Burns, T., E.A. Harding, and B.D. Tutty. *Cowichan River Assessment (1987): The influence of river discharge on sidechannel fish habitats.* Can. MS Rep. Aquat. Sci. No. 1999: v + 24p.

The Cowichan - Koksilah Water Management Plan - Final Report (MOE&P, 1986) recommended that flow releases from the Cowichan Lake weir be studied and alternative operational strategies be examined to optimize storage release flows to the Cowichan River for the most beneficial use of all species of salmonids while meeting the existing water license requirements. On February 12, 1987, the Regional Water Manager (B. Hollingshead) invited the Department of Fisheries and Oceans and the Provincial Fisheries Branch to undertake joint flow regime studies during that year. The Provincial Fisheries Branch carried out selected studies on the Cowichan mainstem while the Department of Fisheries and Oceans responsibility was to determine the influence of river discharge on sidechannel fish habitats of which this study reports.

The present rule curve for the Cowichan lake weir is operated to provide a minimum river flow of 7.08 m^3/s. (250 cfs.) and 9.91 m^3/s. (350 cfs.) after September 15 from a storage supply of approximately 61 million m^3/s. (49,700 acre/ft.). The duration of flow release begins when weir control of the lake is accomplished (spring) through to fall when the storage is exhausted and lake inflow equals outflow, or fall rains recharge the watershed.

This report identifies 142 sidechannels and classifies them into four categories defined as **flood channels, active channels, back channels,** and **relic channels**. Field assessments during 1987 at flows of 20 m^3/s., 7.08 m^3/s., and 4.48m^3/s. were conducted to ascertain the amount of wetted sidechannel fisheries habitat that was lost as discharge to the Cowichan River was reduced.

The loss of 17,897 m^2. of **active sidechannel** habitat of the sidechannels selected for analysis is considered significant when flows were reduced from 7.08 m^3/s. to 4.48 m^3/s. and represented an average loss of 12 - 17% of the total wetted area of this sidechannel type in the upper, middle and lower Cowichan River sidechannel zones. The **flood, back** and **relic** sidechannel categories did not appear to sustain significant losses.

The report recommends against reduction of flow below 7.08 m^3/s. and conclude optimum wetted area in sidechannels cannot be satisfied from the existing lake storage capacity. The report also recommends individual enhancement strategies be developed for each sidechannel as part of a comprehensive multi-species salmonid production plan for this watershed.

Résumé

Burns, T., E.A. Harding, et B.D. Tutty. Effet produit par le débit de la revière Cowichan sur l'habitat halieutique de ses canaux latéraux d'après une étude faite en 1987. Can. MS Rep. Aquat. Sci. No: 1999: V + 24 p.

Le rapport final du projet d'aménagement des eaux des rivières Cowichan et Kokallah (MOE&P, 1988) recommandait l'étude des cycles d'écoulement du barrage du lac Cowichan et l'examen de stratégies opérationnelles de rechange visant à l'utilisation maximale de l'écoulement des eaux de réserve dans la rivière Cowichan, ceci afin de permettre une production accrue de toutes les espéces de salmonidés, tout en satisfaisant les exigences du permis d'exploitation hydraulique. Le 12 février 1987, le gestionnaire des eaux régionales, M.B. Hollingshead, invita le ministère des Pêches et des Océans et la direction provinciale des Pêches à mettre sur pied au cours de l'année un programme d'études commun ayant pour objet le régime d'écoulement des eaux. La direction provinciale des Pêches fit des études sur le cours d'eau principal de la Cowichan alors qu'il incombait au ministère des Pêches et des Océans de déterminer les incidences du débit de la rivière sur l'habitat halieutique de ses canaux latéraux. D'est ce dernier point qui fait l'objet du présent rapport.

La courbe actuelle des niveaux optimaux du barrage du lac Cowichan est réglée de maniére à fournir un débit minimal de 7.08 m^3/s. (250 p^3/s.) passant à 9,91 m^3/s. (350 p^3/s.) après le 15 septembre, au moyen d'une réserve contenant environ 61 millions de m^3/s. ou 49 700 acres/p d'eau. L'écoulement du lac est contrôlé à l'aide du barrage du printemps jusqu'en automne. A ce moment-là, soit que la réserve est épuisée et que la venue d'eau du lac est égale à l'écoulement, soit que les pluies d'automne ont recommencé à remplir le bassin hydrographique.

Dans le présent rapport, on dénombre 142 canaux latéraux appartenant aux quatre catégories suivantes : canaux de crue, canaux de retenue, canaux actifs et canaux résiduels. Des estimations sur le terrain ont été faites alors que l'écoulement était respectivement de 20 m^3/s, 7.08 m^3/s et 4.48 m^3/s. Elles avaient pour but d'évaluer la perte d'habitat halieutique enregistrée dans les canaux latéraux à la suite de la baisse du débit de la revière Cowichan.

Une perte de 17 897 m^2. en habitat enregistrée dans les canaux latéraux actifs, pris séparément, est considérée comme importante, compte tenu de ce que l'écoulement est passé de 7.08 m^3/s. a 4.48 m^3/s. La superficie perdue représentait une perte moyenne de 12 à 17 % de l'étendue d'eau totale des canaux latéraux actifs contenus dans les zones de canaux latéraux supérieure, moyenne et inférieure de la revière Cowichan. En revanche, ni les canaux de crue, de retenue ou résiduels n'accusaient de perte importante.

Le rapport recommande de ne pas diminuer l'écoulement à moins de 7.08 m^3/s. et conclut que la réserve en eau du lac est actuellement insuffisante pour recouvrir au maximum la surface des canaux latéraux. Le rapport recommande aussi l'élaboration de stratégies individuelles de mise en valeur pour chacun des canaux latéraux, dans le cadre d'un projet global de production des diverses espèces de salmonidés dans ce bassin hydrographique.

1.0 Introduction

The Cowichan watershed, located on the southeastern portion of Vancouver Island, (Figures 1 and 2) is a major salmonid producing stream for commercial, Indian and recreational fisheries. Since 1958 the Cowichan River discharge has been regulated by a weir at the outlet of Cowichan Lake, 50 km. upstream from the mouth of the river. The discharge is controlled to meet the water licence requirements of Fletcher Challenge Ltd.; water is withdrawn from the river at a pumphouse 10 km. upstream from the mouth for use at the Crofton pulpmill. The rule curve requirements established in 1958 to manage river flows were amended in 1974 (DeBeck, 1974) and these amendments are still in effect. The **Cowichan Water Management Plan - Final Report** (MOE&P 1986) recommended that flow releases from the Cowichan Lake weir be re-examined and operational strategies be reviewed to optimize fisheries management objectives while meeting the water licence requirements of B.C. Forest Products Ltd.

On February 16, 1987, Dr. B. Hollingshead, of the Provincial Ministry of Environment and Parks (MOE&P), Water Management Branch invited the Federal Department of Fisheries and Oceans (DFO) and the Provincial Fisheries Branch to conduct joint flow regime studies to examine fisheries flow requirements in the Cowichan River and its sidechannels. The Provincial Fisheries Branch carried out selected studies on the mainstem while the Federal Department of Fisheries and Oceans undertook the sidechannel assessments. This report summarizes the sidechannel studies. The Cowichan River studies will be reported separately by the Provincial Fisheries Branch.

Key concerns to the federal and provincial fisheries agencies are the effects the timing and rate of water releases from the Cowichan Lake weir have downstream on egg incubation, rearing and growth of fry and juvenile salmonids, and adult migration and spawning. The objective of the combined study was to review the operational rule curve for Cowichan Lake weir so that the release of the 49,700 acre feet of existing storage from the lake to the river would provide the most economical and social benefits for fish production while still fulfilling the licence requirements of Fletcher Challenge Ltd. and other water users.

The present operational rule curve for the weir (Appendix 2) provides a minimum spring and summer flow of 7.08 m^3/s., (250 cubic feet per second). If there is adequate storage the rule curve specifies an increase to 9.91 m^3/s. (350 cfs.) on September 15 each year to assist the movement of chinook salmon from the estuary to their spawning grounds. In dry years when the water storage is exhausted in late fall, Cowichan Lake inflow equals outflow to the river and this increase is impossible.

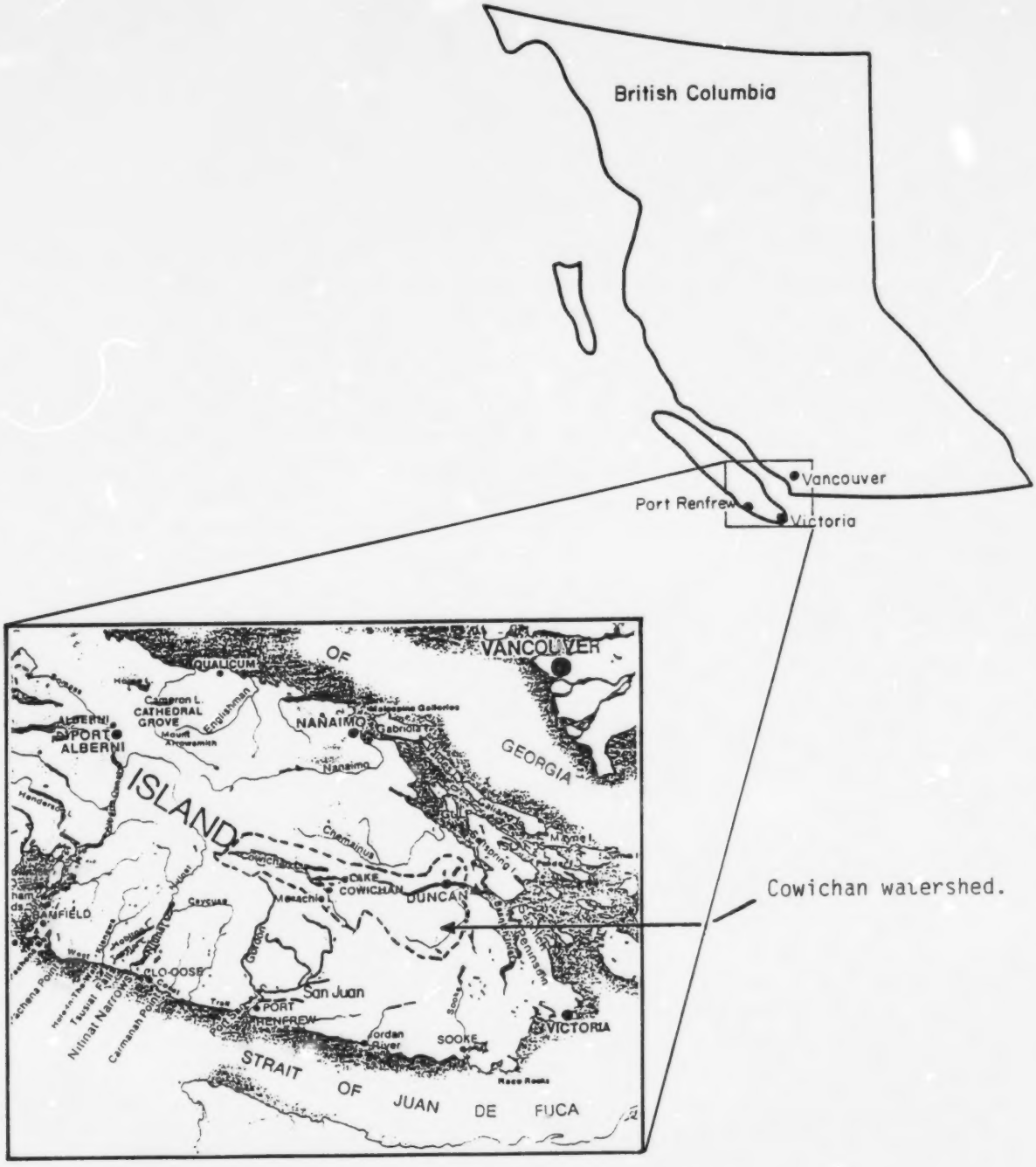


Figure 1. Location of the Cowichan watershed

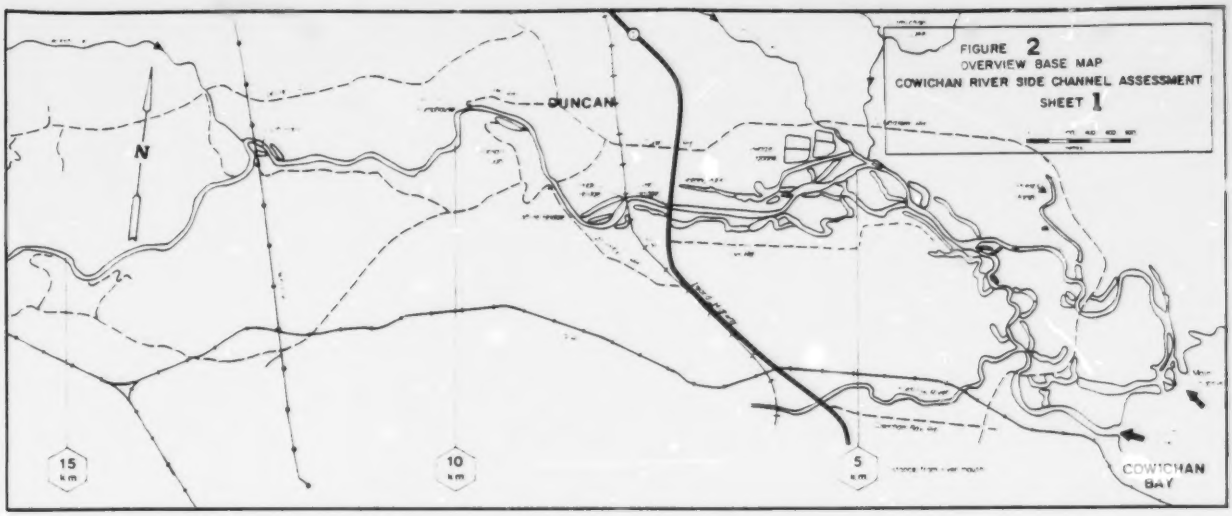
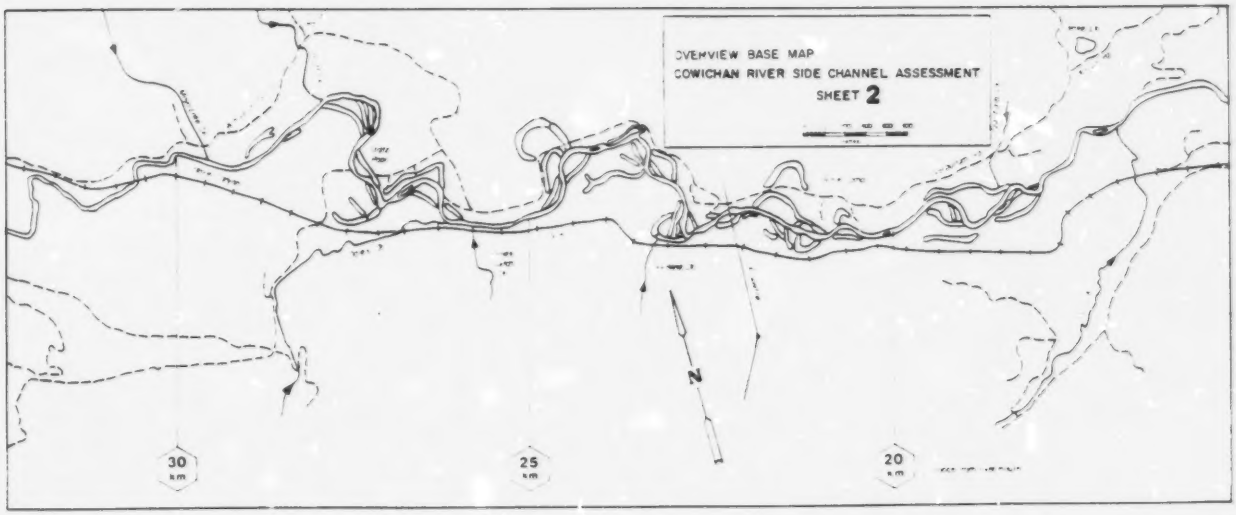
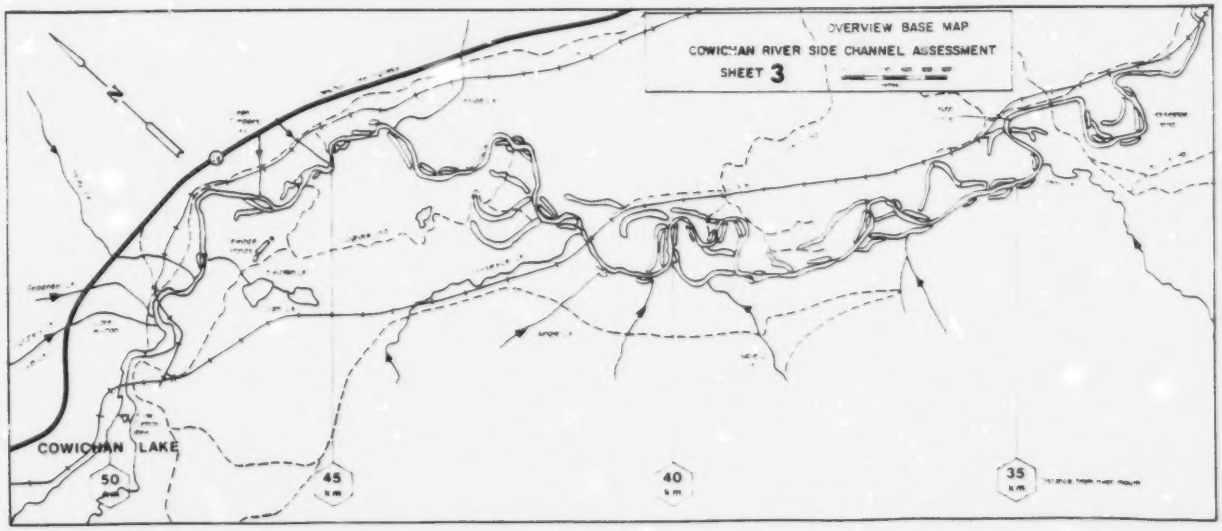


FIGURE 2
OVERVIEW BASE MAP
COWICHAN RIVER SIDE CHANNEL ASSESSMENT
SHEET 1
DUNCAN
N
15 km
10 km
5 km
COWICHAN BAY


OVERVIEW BASE MAP
COWICHAN RIVER SIDE CHANNEL ASSESSMENT
SHEET 2
N
30 km
25 km
20 km


OVERVIEW BASE MAP
COWICHAN RIVER SIDE CHANNEL ASSESSMENT
SHEET 3
N
COWICHAN LAKE
50 km
45 km
40 km
35 km

2.0 Methodology

2.1 Study Plan

The existing rule curve for the Cowichan Lake weir provides a minimum summer maintenance flow of 7.08 m^3/s. to the Cowichan River. However, it was unknown whether the sidechannel habitat was sensitive to a reduction in flow below 7.08 m^3/s. If sidechannels were insensitive to flow reduction, and the Cowichan mainstem would not be negatively influenced, available water storage in the lake might be conserved in summer for augmented flows during fall salmon spawning periods.

This study monitored the wetted area of selected sidechannels in 1987 as the natural spring flows dropped from 20 m^3/s. to 7.08 m^3/s.; then these selected sidechannels were measured at 7.08 m^3/s. discharge; and finally examined at a reduced 4.48 m^3/s. discharge. Conclusions on the best use of the available storage as it relates to sidechannels would be based on the amount of wetted habitat area lost at the maintenance flow of 7.08 m^3/s. and the lower flow of 4.48 m^3/s. and compared to other possible uses of that water.

2.2 Preassessment

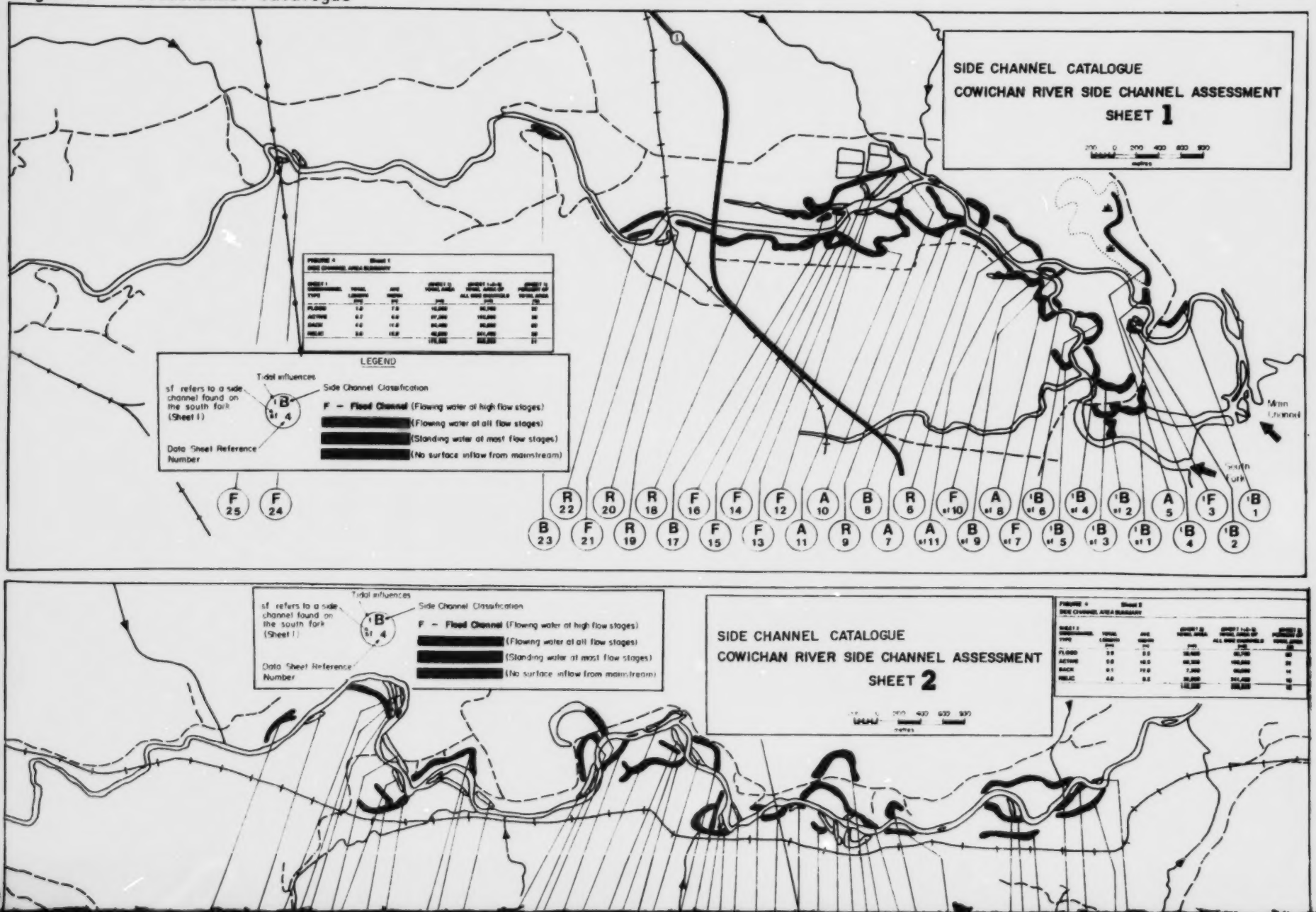
The sidechannels were identified on a 1:25,000 scale air photo mosaic (June, 1979 photography) and enumerated beginning at the estuary and classified as a Cowichan sidechannel catalogue, Figure 3: (Sheets 1,2, and 3).

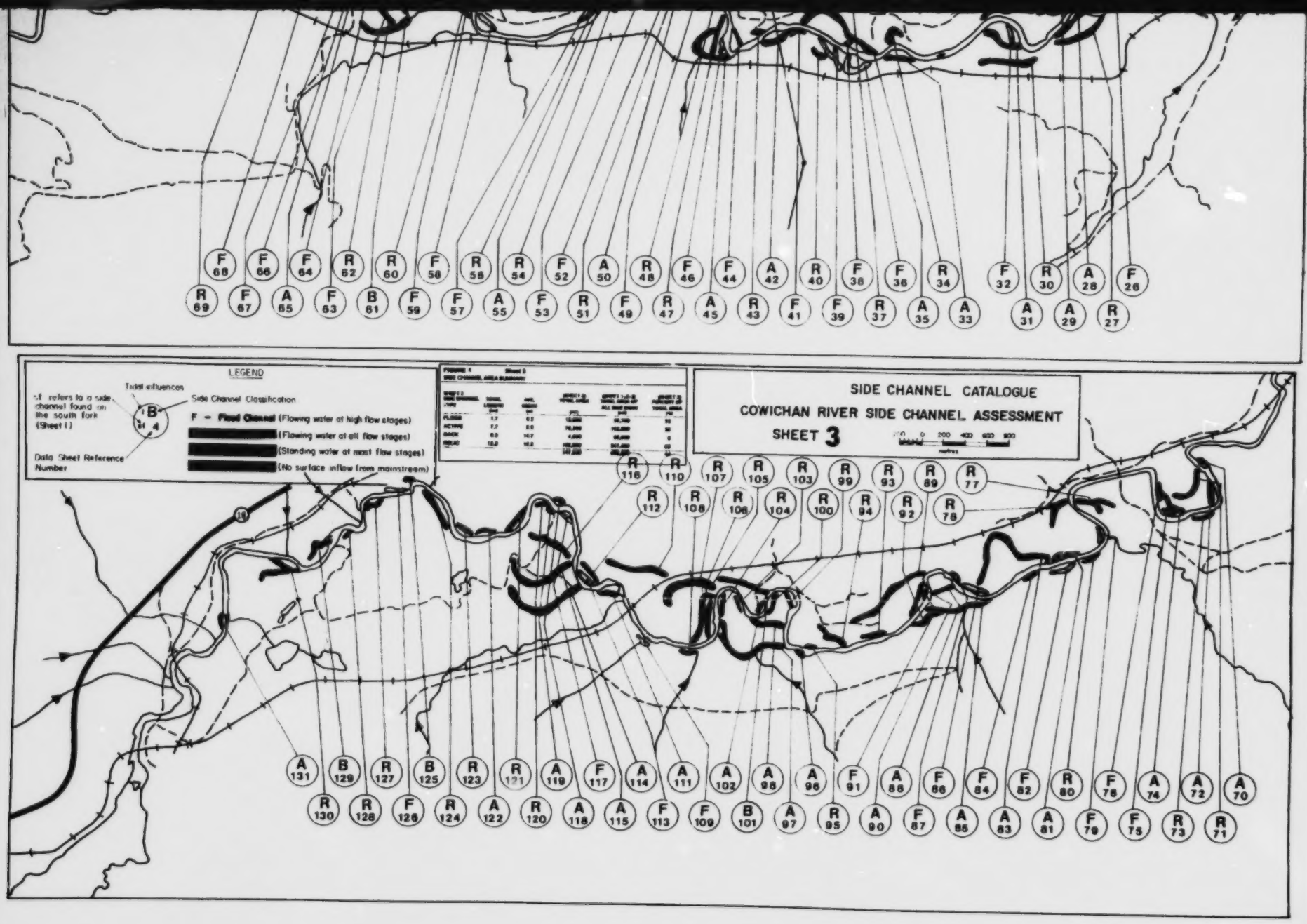
The channels were classified into the following four categories:

> **Flood Channels (F).** Flood channels are intermittently flowing channels that usually dewater in the summer. They are found in association with gravel bars adjacent to the main stem. These channels usually have little debris or vegetative cover and are subject to the flushing effect of winter flood discharges*.

* In the lower Cowichan River, an old flood channel [A10(upper)] located behind dykes has been developed (1986) as an enhanced semi-natural salmon spawning sidechannel and represents the first one constructed in this watershed.

Figure 3 Sidechannel Catalogue


SIDE CHANNEL CATALOGUE
COWICHAN RIVER SIDE CHANNEL ASSESSMENT
SHEET 1
LEGEND
sf refers to a side channel found on the south fork (Sheet 1)
Tidal influences
Side Channel Classification
Data Sheet Reference Number
F – Flood Channel (Flowing water at high flow stages)
(Flowing water at all flow stages)
(Standing water at most flow stages)
(No surface inflow from mainstream)
Main Channel
South Fork
SIDE CHANNEL CATALOGUE
COWICHAN RIVER SIDE CHANNEL ASSESSMENT
SHEET 2


LEGEND
Tidal influences
s.f. refers to a side channel found on the south fork (Sheet 1)
Side Channel Classification
F – Flood Channel (Flowing water at high flow stages)
(Flowing water at all flow stages)
(Standing water at most flow stages)
(No surface inflow from mainstream)
Data Sheet Reference Number
SIDE CHANNEL CATALOGUE
COWICHAN RIVER SIDE CHANNEL ASSESSMENT
SHEET 3
metres

Active Channels (A). Active channels are typically perennially flowing channels that maintain some flow in the summer. The channels are usually well vegetated and contain debris cover and are often protected from the full effect of winter floods by the presence of a log jam or a natural gravel berm at their inlets. Active channels have flow all year round and their water level is usually influenced by that of the main stem.

Back Channels (B). Back channels are perennial channels that contain standing water during the dry summer period. The connection with the main channel is at the downstream end where the back channel and river level are at the same elevation. The back channels are submerged as a result of the following influences:

g = groundwater
t = tributary
T = Tidal

Relic Channels (R). Relic channels represent historic locations of the main channel. In this study, relic channels specifically refer to channels that no longer directly respond to the water level fluctuations in the main river. Because of their isolation from the river, water levels are commonly controlled by tributary streams and/or ground water levels.

2.3 Field Assessment (1987)

Field assessment and measurement of available habitat (expressed as wetted surface area in m^2.) was undertaken during 1987.

The sidechannels were surveyed during the spring-fall hydrographic period. The Cowichan R. flow was managed at 7.08 m^3/s. (250 cfs.) until August 5, 1987. The Vancouver Island Region Water Manager (B. Hollingshead) ordered the flow reduced to 4.48 m^3/s. (160 cfs.) for a period between August 8 - 10, 1987 to accomodate this study. Discharge was returned to 7.08 m^3/s. (250 cfs.) by August 13, 1987 and maintained at that level. Increased flows prescribed in the rule curve unfortunately was not available for spawning chinook salmon on or after September 15, 1987. Fall rains began to recharge the Cowichan River on November 4, 1987.

Field inspections took place during a range of discharges from a high of 42.5 m^3/s. (1500 cfs.) to a low of 4.45 m^3/s. (160 cfs.). The following data were collected for each sidechannel selected.

- **Sidechannel length** and average **channel width**, measured in meters by a belt chain.
- Average sidechannel **wetted width**, measured in meters by a belt chain.
- **Discharge**, estimated by the standard float method, using the formula:

$$[Q = V A]$$

where **V = average velocity calculated from the surface velocity (length/time) corrected by 0.8 for bottom roughness.**

where **A = channel area**
= width x average depth

- **Bed material composition**, estimated per cent (%) composition of fines, gravels, cobbles, boulders and bedrock.
- **Compaction** of bed material [nil, light, moderate, heavy].
- **Fish utilization**: species and life history phases present.
- **Fisheries enhancement suggestions**.

The information was compiled on a sidechannel inspection form designed for this study and included diagrams of plan and cross sectional views and a longitudinal profile sketch, Appendix 1.

Sidechannel wetted area estimates were obtained from measured lengths and average widths (Figure 4) measured for each channel.

Appendix 2 contains the existing Cowichan weir operational rule curve. Appendix 3 contains historic weir levels and river discharge data for the period 1982 - 87 from Water Survey of Canada records of gauge #HA 009 (lake levels) and gauge #08 HA 002 (river levels) at Lake Cowichan, B.C.

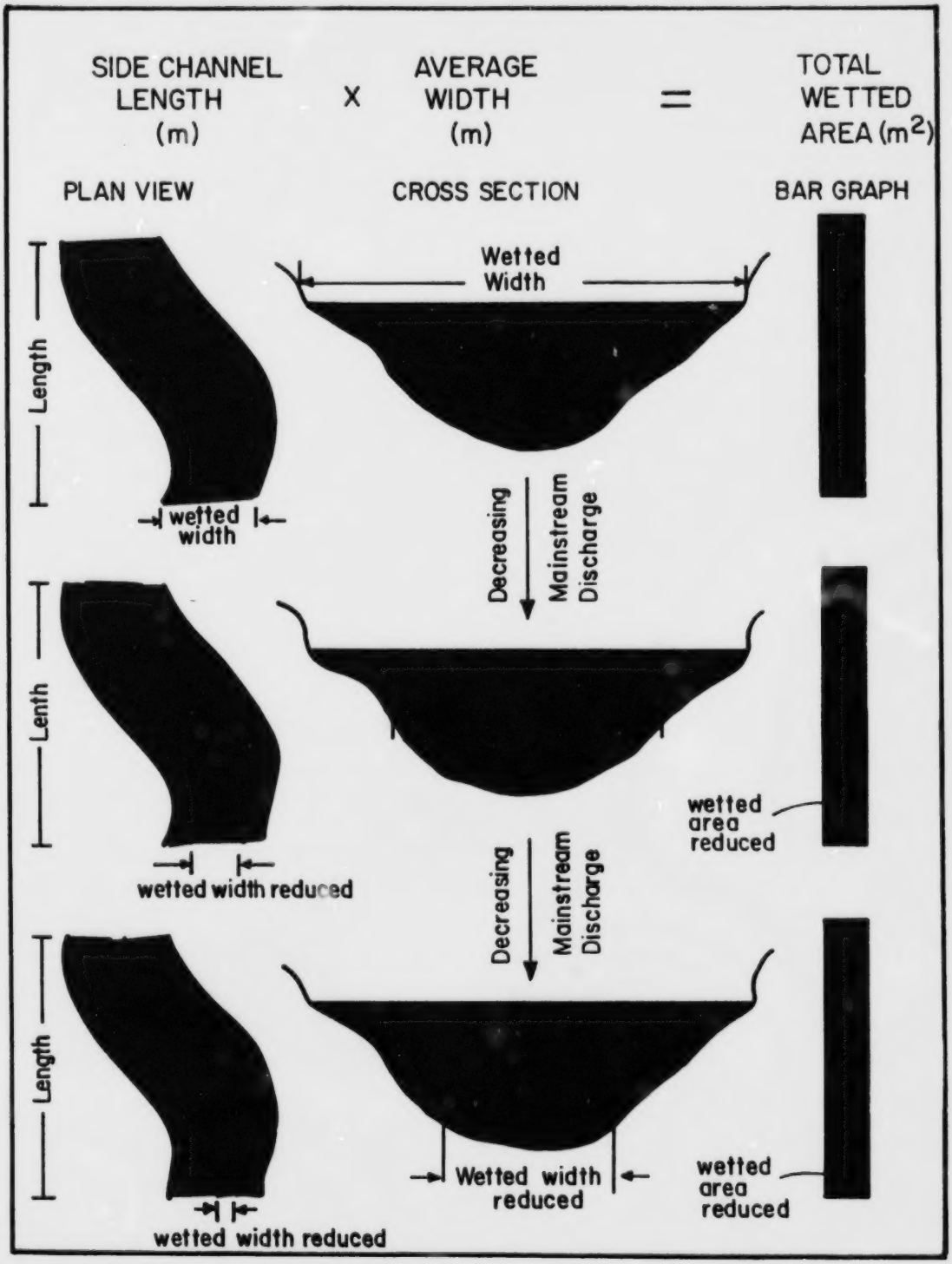


Figure 4. Methodology for the measurement of Side Channel Area.

3.0 Results

A total of 142 sidechannels were identified, classified, mapped, and field inspected in 1987. The results are compiled in Appendix 1. All sidechannels are identified in Figure 3, the sidechannel areas are compiled in Table 1 (p. 15), and flow regime and sidechannel wetted areas displayed in Figure 5 (p. 21), Sheets 1,2 and 3.

The total channel area of each Cowichan sidechannel type was summarized (Table 2, p. 21). The reduction in the wetted area of the sidechannels was measured over the summer of 1987 for each category of sidechannel: Active, Back, Flood and Relic channels. These data were included in the analysis only if the following criteria were met:

1. The sidechannel contained fish at some period during the summer.

2. Sidechannel habitat wetted area measurements were available for all three discharge levels of this study (i.e., 20, 7.08 and 4.48 m^3/s.).

The sidechannels that met the criteria are identified in Table 1 and are identified with a [o] notation.

3.1 Active Sidechannels

The active channels are the most important summer fish rearing habitat and many are also utilized for adult spawning and juvenile salmonid over-wintering requirements. The total area of active channels was measured at three discharge levels and represents 33 channels noted in Table 1 that fit the analysis criteria outlined above. The results were:

Active Channels (Fig. 5)	Discharge Level	Total Wetted Area (m^2)
	20 m^3/s.	148,839 m^2.
	7.08 m^3/s.	120,831 m^2.
	4.48 m^3/s.	102,934 m^2.

There was a 28,008 sq. meter (19%) reduction of active channel wetted area when flow was reduced from 20 m^3/s. to 7.0 m^3/s. A further 17,897 sq. meter (15%) reduction of wetted area occurred between 7.0 m^3/s. to 4.45 m^3/s. The reduction of wetted area from 7.0 m^3/s. to 4.45 m^3/s. in the active sidechannels that met the criteria was significant and unexpected, therefore, a more detailed analysis was undertaken to determine whether these losses occurred disproportionately in Sheet 1,

2 or 3 (lower, middle, and upper Cowichan River). The active sidechannels on Sheets 1, 2 and 3 were analyzed as three separate groups.

3.1.1 Lower Active Sidechannels (Figure 5, Sheet 1 - Lower Cowichan Sidechannels)

The following total wetted areas were calculated for the lower active sidechannels.

Active Channels (Fig 5, Sheet 1)	Discharge Level	Total Wetted Area
	20 m^3/s.	73,215 m^2.
	7.08 m^3/s.	59,390 m^2.
	4.48 m^3/s.	49,445 m^2.

There was a 13,825 sq. meter (19%) reduction of sidechannel wetted area between 20 m^3/s. to 7.0 m^3/s. Between 7.08 m^3/s. to 4.48 m^3/s., there was a 9,945 sq. meter (17%) reduction in sidechannel wetted area.

3.1.2 Middle Active Sidechannels (Figure 5, Sheet 2 - Middle Cowichan Sidechannels)

The total wetted areas were calculated for the middle active sidechannels. The results were:

Active Channels (Fig 5, Sheet 2)	Discharge Level	Total Wetted Area
	20 m^3/s.	15,774 m^2.
	7.0 m^3/s.	9,845 m^2.
	4.45 m^3/s.	8,161 m^2.

There was a 5,927 sq. meter (38%) reduction in wetted area between 20 m^3/s. to 7.08 m^3/s. Between 7.0 m^3/s. and 4.48 m^3/s., there was 1,684 sq. meter (17%) reduction in sidechannel wetted area.

3.1.3 Active Sidechannels (Figure 5, Sheet 3 - Upper Cowichan Sidechannels)

The following total wetted areas were calculated for the upper active sidechannels. The results were:

Active Sidechannels (Fig 5, Sheet 3)	Discharge Level	Total Wetted Area
	20 m^3/s	59,852 m^2
	7.08 m^3/s	51,596 m^2
	4.48 m^3/s	45,329 m^2

There was a 8,256 sq. meter (14%) reduction in wetted area between 20 m^3/s. and 7.08 m^3/s. Between 7.08 m^3/s. and 4.48 m^3/s., there was a 6,267 sq. meter (12%) reduction in sidechannel wetted area.

3.2 Flood Sidechannels

The flood channels support spawning in the fall and may support overwintering juvenile coho and trout. These flood channels have limited use as rearing channels in the summer since most are dry. The reductions in wetted area of flood channels is tabulated below. These calculations represent only 6 channels that conform to the criteria outlined in Section 3.0. The results were:

Flood Channels (Fig 5, Sheets 1-3)	Discharge	Total Wetted Area
	20 m^3/s.	1,539 m^2.
	7.08 m^3/s.	1,021 m^2.
	4.45 m^3/s.	766 m^2.

This represents a 518 sq. meter (34%) reduction of wetted area between 20 m^3/s. and 7.0 m^3/s. discharge and a 255 sq. meter (25%) reduction between the 7.0 m^3/s. and 4.48 m^3/s. discharges. Most of this reduction is attributed to two of the five channels examined.

3.3 Back Sidechannels

Back channels are important rearing areas particularly for coho salmon since they contain standing water throughout the year. They can also be important chum salmon spawning areas. Only 3 back channels met the analysis criteria outlined in Section 3.0.

The results were:

Back Channels (Fig 5, Sheets 1-3)	Discharge	Total Wetted Area
	20 m^3/s.	7,682 m^2.
	7.08 m^3/s.	4,925 m^2.
	4.48 m^3/s.	4,397 m^2.

This represents a 2,757 sq. meter (36%) reduction in wetted area between 20 m^3/s. and 7.0 m^3/s. discharges, and 528 sq. meter (11%) reduction in wetted area between 7.08 m^3/s. and 4.48 m^3/s. discharges. Most of this reduction is attributed to one of the three back channels examined.

3.4 Relic Sidechannels

Four (4) relic channels did fit the criteria for analysis between 7.08 m^3/s. and 4.48 m^3/s. The results were:

Relic Channels (Fig 5, Sheets 1-3)	Discharge	Total Wetted Area
	7.08 m^3/s.	14,267 m^2.
	4.48 m^3/s.	13,897 m^2.

This indicates a 370 sq. meter (2.5%) reduction of wetted area which occurs in one of the four channels examined. It was not possible to determine whether this reduction was a response to lowering of the water table or directly related to reduced river discharge.

4.0 Discussion and Conclusions

4.1 Sidechannels - General Discussion

The sidechannels occur in three distinct zones in the Cowichan River below the weir and are partitioned into three zones (lower, middle, upper) in the sidechannel catalogue. There are four categories of sidechannels: Flood, Active, Back and Relic. The reduction of wetted area between 7.08 and 4.48 m^3/s. for flood channels (255 m^2.), back channels (528 m^2.) and relic channels (370 m^2.) that met the selection criteria for this study was not considered significant. However, the reduction of 17,897 m^2. of wetted area in active sidechannels that met the criteria appeared significant. A detailed analysis of active sidechannels revealed there was 9,945 m^2. of wetted area (17%) lost in the lower Cowichan, 1,684 m^2. (17%) lost in the middle Cowichan River, and 6,267 m^2. (12%) lost in upper Cowichan River between 7.08 and 4.48 m^3/s. discharge. However, the distribution of active sidechannels between each of these three sidechannel zones was not equal (i.e., there are more active channels in one zone than another). However, the losses of wetted area in the active sidechannels averaged 12 - 17% in the three zones which indicated the habitat losses were proportional within the three sidechannel zones.

4.2 Active Sidechannels

The loss of active channel habitat appeared significant. Since the mainstem Cowichan River below the weir is 50 km. long and averages 30 m. wide, the 17,897 m^2. of lost wetted area of the selected active sidechannel habitat represents approximately 1 - 2% of the 1.5 million m^2. of wetted area contained in the mainstem. Of course, only a fraction of this main river wetted area is comparable as high quality rearing habitat and the actual proportion and significance to fisheries production is, therefore, much higher since not all sidechannels were measured at the three discharge levels in this study.

A principal concern associated with reducing summer flow is whether active channels dewater completely, which result in direct fish mortality. There was a reduction in wetted area in many active channels; however, major stranding of rearing salmonids was not observed. It was observed that fish were concentrated into higher population densities within the remaining wetted habitats, which likely increases stress and competition for food and space. Increased susceptibility to predation could not be assessed in this study.

Approximately 75% of the loss of wetted area in active channels is attributed to nine channels; (A5, A8, A10, A35, A72, A85, A97, A115, A131). There is a natural lowering of the water table each season, and the estimated losses in wetted area contain an unknown proportion that cannot be attributed to the effect of reduction in river discharge per se.

The authors conclude that active sidechannels were significantly affected by the reduction of summer flow between 7.08 and 4.48 m^3/s. Specific sidechannels that would be susceptible could be examined to determine if groundwater or river inflow could be augmented to mitigate habitat losses in the event flows are reduced. The active channels averaged between 12% and 17% loss in wetted area in the upper, middle and lower Cowichan River. Since 2.8 m^3/s. (100 cfs.) of the Cowichan River is withdrawn above Duncan for the Crofton pulp mill, increased sensitivity of the sidechannels to flow reduction below the point of diversion was expected. However, this did not appear to be the case. This result may be associated with the presence of a higher summer water table in the lower river area adjacent to the estuary.

The authors conclude that sidechannel habitat cannot be maintained by available storage in Cowichan Lake and its release from the weir throughout the summer estimated to be in the order of 42 m^3/s. (1500 cfs.) to provide optimum wetted area in sidechannels. Such a flow may not be ideal for the Cowichan R. mainstem. The current Cowichan Lake storage would be exhausted in approximately one month at such high flows (Burns, 1987).

Due to the significant loss of active sidechannel rearing habitat between 7.08 and 4.48 m^3/s., the authors do not recommend reductions of summer flows below 7.08 m^3/s.

Finally, the authors recommend individual enhancement strategies should be developed for each sidechannel that has significant potential for increased salmonid production as part of a comprehensive multi-species salmonid production plan for this watershed.

Table 1 . COWICHAN RIVER SIDE CHANNEL CLASSIFICATION INDEX (1987)

Side Channel Number	Distance from the mouth (km)	Side Channel Class *	Side Channel Length (m)	Other water Sources **	Side Channel Wetted Area (Square Meters) at discharges of: 42 cms (1470 cfs)	30 cms (1050 cfs)	20 cms (700 cfs) ***	7 cms (245 cfs)	4.48 cms (156 cfs)	Salmon Spawning
South Fork (sf)										
sf B 1	0.52	Back	1,100	Tidal	0 to 11,000 depending on the tide level					
sf B 2	0.74	Back	340	Tidal	0 to 2,720 depending on the tide level					
sf B 3	1.55	Back	840	Tidal, Wt	0 to 6,720 depending on the tide level					
sf B 4	1.61	Back	220	Tidal	0 to 1,760 depending on the tide level					
sf B 5	1.84	Back	155	Tidal	0 to 1,550 depending on the tide level					
sf B 6	2.03	Back	480	Tidal	0 to 3,600 depending on the tide level					
sf F 7	2.45	Flood	100	Wt	-	-	17	0	0	Yes
sf A 8	2.46	• Active	785	Trib, Grd	11,775	11,775	11,775	9,420	8,635	Yes
sf B 9	2.80	Back	150	None	-	-	900	600	-	
sf F 10	2.98	Flood	150	None	900	-	310	-	45	Yes
sf A 11	2.99	• Active	610	Wt, Trib	3,050	2,754	2,440	610	0	Yes
Main Channel										
B 1	1.36	Back	350	Tidal	0 to 5,250 depending on the tide level					
B 2	2.04	Back	210	Tidal	0 to 3,150 depending on the tide level					
F 3	2.11	Flood	160	Tidal	0 to 1,600 depending on the tide level					
B 4	2.29	Back	200	Tidal	- to 6,000 depending on the tide level					
A 5	2.57	• Active	1,500	Grd, Wt	45,000	45,000	45,000	42,000	37,500	
R 6	3.49	Relic	750	Grd, Wt	3,500	90	-	-	20	
A 7	4.21	• Active	400	Wt	6,000	6,000	5,600	1,260	810	Yes
B 8	4.36	• Back	583	Trib, Wt	12,264	7,008	6,570	4,000	3,572	Yes
R 9	4.41	Relic	1,000	Wt	-	1,600	1,200	-	0	
A 10 lower	4.94	• Active	1,200	Trib, Grd	12,000	9,600	7,200	6,000	2,400	Yes
A 10 upper		• Active	600	None	2,400	2,400	1,200	100	100	Yes
[illegible]	5.36	Active	1,600	Trib, Wt	8,000	8,000	8,000	-	3,200	Yes
[illegible] 12	5.37	Flood	138	None	-	966	922	-	0	Yes
[illegible]	5.42	Flood	300	None	2,400	780	0	0	0	Yes
[illegible]	5.49	Flood	190	None	20	0	0	0	0	
[illegible]	5.63	Flood	220	None	-	0	0	0	0	Yes
F 16	5.68	• Flood	60	Wt	-	300	135	60	54	

• Met the criteria for analysis.
* See side channel definitions in this report.
** Other sources of water rather than the mainstem of the Cowichan River.
Abbreviations Trib.= Tributary, Grd.= Ground Water, Bd.= Beaver Dams, Wt.= Water Table
*** cms = cubic meters per second, cfs = cubic feet per second, - = no measurement taken, 0 = no water present.

Table 1. COWICHAN RIVER SIDE CHANNEL CLASSIFICATION INDEX (1987) (Page 2)

Side Channel Number	Distance from the mouth (km)	Side Channel Class *	Side Channel Length (m)	Other water Sources **	Side Channel Wetted Area (Square Meters) at discharges of:					Salmon Spawning
					42 cms (1470 cfs)	30 cms (1050 cfs)	20 cms (700 cfs) ***	7 cms (245 cfs)	4.48 cms (156 cfs)	
B 17	5.83	◦ Back	100	Wt		600	600	600	500	
R 18	6.19	◦ Relic	900	Wt	16,200	-	-	13,500	13,500	
R 19	6.96	Relic	325	Wt	0	0	0	0	0	
R 20	7.39	Relic	500	None	0	0	0	0	0	
F 21	7.52	Flood	84	None	200	200	35	-	130	
R 22	7.60	Relic	320	None	0	0	0	0	0	
B 23	9.02	Back	200+	Grd, Wt	-	3,000	2,800	-	-	Yes
F 24	11.90	Flood	135	None	-	0	0	0	0	
F 25	12.10	Flood	113	None	-	0	0	0	0	
F 26	18.13	Flood	98	None	-	0	0	0	0	
R 27	18.17	Relic	320	Grd	320	320	81	-	0	
A 28	18.35	◦ Active	370	None	-	6,290	2,590	1,850	1,480	Yes
A 29	18.51	Active	500	Grd, Wt	3,400	3,400	2,000	-	1,000	Yes
R 30	18.98	Relic	550	Grd	550	550	550	110	50	
A 31	19.05	◦ Active	400	None	-	4,000	3,600	2,800	2,800	Yes
F 32	19.14	Flood	160	None	0	0	0	0	0	
A 33	20.29	Active	270	Grd, Wt	2,430	1,620	648	-	437	Yes
R 34	20.54	Relic	270	None	0	0	0	0	0	
A 35	20.70	◦ Active	730	Grd, Wt	2,920	2,190	1,300	1,300	560	Yes
A 35 lower		Active	100	Grd, Wt	-	1,000	950	-	810	Yes
F 36	20.77	Flood	350	Wt	750	300	160	-	50	Yes
R 37	20.87	Relic	415	None	0	0	0	0	0	
F 38	20.99	Flood	100	None	0	0	0	0	0	
F 39	21.14	Flood	360	Wt	120	60	-	-	0	Yes
R 40	21.19	Relic	250	Wt	0	0	0	0	0	
F 41	21.41	Flood	200	Trib, Wt	800	360	200	-	21	Yes
A 42	21.53	◦ Active	250	None	-	1,250	1,250	1,000	600	Yes
R 43	21.95	Relic	70	Wt	-	50	0	0	0	
F 44	22.04	◦ Flood	120	None	650	-	500	345	345	Yes
A 45	22.19	Active	900	Trib/Wt/Bd	-	140	70	-	0	Yes
F 46	22.20	Flood	200	None	-	0	0	0	0	Yes

◦ Met the criteria for analysis.

* See side channel defintions in this report.

** Other sources of water rather than the mainstem of the Cowichan River.
Abbreviations Trib.= Tributary, Grd.= Ground Water, Bd.= Beaver Dams, Wt.= Water Table

*** cms = cubic meters per second, cfs = cubic feet per second, - = no measurement taken, 0 = no water present.

Table 1. COWICHAN RIVER SIDE CHANNEL CLASSIFICATION INDEX (1987) (Page 3)

Side Channel Number	Distance from the mouth (km)	Side Channel Class *	Side Channel Length (m)	Other water Sources **	Side Channel Wetted Area (Square Meters) at discharges of:					Salmon Spawning
					42 cms (1470 cfs)	30 cms (1050 cfs)	20 cms (700 cfs) ***	7 cms (245 cfs)	4.48 cms (156 cfs)	
R 47	22.22	Relic	260	None	0	0	0	0	0	
R 48	22.70	Relic	452	Wt	360	-	180	62	-	
F 49	22.86	Flood	140	None	0	0	0	0	0	
A 50	23.03	◦ Active	600	Grd, Wt	4,800	3,600	-	720	720	Yes
R 51	23.09	◦ Relic	370	Grd	-	183	122	95	95	
F 52	23.13	Flood	230	Wt	56	30	10	-	0	
F 53	23.40	Flood	200	None	0	0	0	0	0	
R 54	23.86	Relic	310	Wt	-	-	-	4	0	
A 55	24.04	Active	610	Trib, Wt	3,050	2,440	1,500	100	100	
R 56	24.11	Relic	200	None	0	0	0	0	0	
F 57	24.29	Flood	265	None	-	225	0	0	0	Yes
F 58	25.59	Flood	194	None	0	0	0	0	0	
F 59	25.87	Flood	348	None	-	744	0	0	0	Yes
R 60	26.04	Relic	900	None	0	0	0	0	0	
B 61 upper	26.70	Relic	180	Grd	-	144	144		105	
B 61 lower		Back	70	Trib. Grd	-	2,592	2,450	-	2,244	
R 62	26.70	Relic	300	Grd, Wt	-	0	0	0	0	
F 63	26.79	Flood	65	None	0	0	0	0	0	
F 64	26.82	Flood	400	None	200	80	0	0	0	Yes
F 65	27.52	◦ Active	435	None	-	5,936	3,432	2,175	2,001	Yes
F 66	27.58	Flood	100	None	-	0	0	0	0	Yes
F 67	27.68	Flood	200	None	0	0	0	0	0	
F 68	28.70	◦ Flood	140	None	-	560	420	240	135	Yes
R 69	28.95	Relic	180	None	0	0	0	0	0	
A 70	31.92	◦ Active	50	Grd	-	-	750	700	700	Yes
A 70 upper		◦ Active	120	Grd, Wt	-	-	15	15	15	Yes
A 70 upper		◦ Active	30	None	-	-	60	45	36	
R 71	32.00	Relic	-	None	-	-	-	-	-	
A 72	32.12	◦ Active	314	None	3,140	1,570	1,413	1,413	835	Yes
R 73	32.45	Relic	266	None	0	0	0	0	0	
A 74	32.66	◦ Active	250	Grd	3,000	1,500	1,500	1,250	1,250	Yes

◦ Met the criteria for analysis.

* See side channel definitions in this report.

** Other sources of water rather than the mainstem of the Cowichan River.
Abbreviations Trib.= Tributary, Grd.= Ground Water, Bd.= Beaver Dams, Wt.= Water Table

*** cms = cubic meters per second, cfs = cubic feet per second, - = no measurement taken, 0 = no water present.

Table 1. COWICHAN RIVER SIDE CHANNEL CLASSIFICATION INDEX (1987) (Page 4)

Side Channel Number	Distance from the mouth (km)	Side Channel Class *	Side Channel Length (m)	Other water Sources **	Side Channel Wetted Area (Square Meters) at discharges of:					Salmon Spawning
					42 cms (1470 cfs)	30 cms (1050 cfs)	20 cms (700 cfs) ***	7 cms (245 cfs)	4.48 cms (156 cfs)	
F 75	32.76	◦ Flood	150	None	900	300	300	300	150	Yes
F 76	33.08	Flood	130	None	1,300	-	34	-	0	
R 77	34.19	Relic	500	Grd	500	-	0	0	0	
R 78	34.17	Relic	236	Trib, Grd	165	142	47	118	118	
F 79	34.55	Flood	265	Wt	-	510	310	-	0	Yes
R 80	34.78	Relic	140	Grd, Wt	-	1	0	0	0	
A 81	34.97	◦ Active	410	Grd	-	3,690	3,485	3,280	3,075	Yes
F 82	35.11	Flood	215	None	-	1,935	24	0	0	Yes
A 83	35.28	◦ Active	500	Trib, Grd	-	2,006	2,000	2,000	2,000	
F 84	35.45	Flood	110	None	-	420	0	0	0	
A 85	35.92	◦ Active	647	Trib, Grd	-	5,823	3,882	3,882	3,235	Yes
F 86	35.94	Flood	190	None	-	950	280	120	-	Yes
F 87	36.20	Flood	60	None	-	240	60	40	-	Yes
A 88	36.30	◦ Active	120	None	-	1,200	1,080	840	600	Yes
R 89	36.57	Relic	1,700	Wt	-	500	0	0	0	
A 90	36.62	◦ Active	360	None	3,600	3,240	-	1,800	1,800	Yes
F 91	36.70	◦ Flood	60	None	700	-	300	76	82	
R 92	37.08	Relic	360	Wt	0	0	0	0	0	
R 93	37.34	Relic	115	Wt	160	90	-	21	10	
R 94 lower	37.73	Relic	180	Wt	-	70	-	-	9	
R 94 upper		Relic	289	None	0	0	0	0	0	
R 95	37.98	Flood	100	None	-	800	0	0	0	
A 96	38.05	◦ Active	150	Grd	-	-	150	150	150	
A 97	38.28	◦ Active	1,300	Trib, Grd	-	16,900	14,300	15,080	13,650	Yes
A 98	38.49	◦ Active	397	None	-	5,161	5,161	3,772	3,414	Yes
R 99	38.92	Relic	196	None	-	240	-	-	130	Yes
R 100	38.97	◦ Relic	210	None	-	756	-	412	412	
B 101	39.06	Back	100	Trib, Grd	1,000	900	-	-	800	Yes
A 102	39.13	◦ Active	160	None	960	480	320	288	288	Yes
R 103	39.45	Relic	120	Wt	8	8	0	0	0	
R 104	39.77	Relic	130	Wt	-	260	-	260	-	Yes

◦ Met the criteria for analysis.

* See side channel definitions in this report.

** Other sources of water rather than the mainstem of the Cowichan River.
Abbreviations Trib.= Tributary, Grd.= Ground Water, Bd.= Beaver Dams, Wt.= Water Table

*** cms = cubic meters per second, cfs = cubic feet per second, - = no measurement taken, 0 = no water present.

Table 1. COWICHAN RIVER SIDE CHANNEL CLASSIFICATION INDEX (1987) (Page 5)

Side Channel Number	Distance from the mouth (km)	Side Channel Class *	Side Channel Length (m)	Other water Sources **	Side Channel Wetted Area (Square Meters) at discharges of: 42 cms (1470 cfs)	30 cms (1050 cfs)	20 cms (700 cfs) ***	7 cms (245 cfs)	4.48 cms (156 cfs)	Salmon Spawning
R 105	39.87	Relic	500	Trib, Grd	2,500	1,100	-	-	1,100	Yes
R 106	39.89	Relic	400	Wt	-	8,000	-	-	0	
R 107	39.94	Relic	370	Wt	1,100	-	-	-	0	
R 108	40.38	Relic	140	Grd, Wt	-	-	560	-	420	Yes
F 109	40.70	Flood	110	Trib	-	-	-	176	66	Yes
R 110	40.70	Relic	2,000	Grd	-	80	-	0	0	Yes
A 111	41.28	o Active	280	None	-	-	1,960	1,960	1,680	Yes
R 112	41.56	Relic	382	None	-	0	0	0	0	
F 113	41.61	Flood	264	None	-	65	0	0	0	
A 114	41.72	o Active	720	Trib, Grd	2,880	-	1,440	720	835	Yes
A 115	41.89	o Active	1,080	Grd	14,040	-	10,800	10,152	9,072	Yes
R 116	41.96	o Relic	960	Grd	-	1,220	260	260	260	Yes
F 117	42.27	Flood	190	Wt	-	420	-	53	0	
A 118 upper	42.47	o Active	385	Wt	-	1,540	1,540	1,540	1,155	
A 118 lower		Relic	200	None	0	0	0	0	0	
A 119	42.65	o Active	70	None	-	-	1,260	1,050	910	Yes
R 120	42.66	Relic	360	None	360	280	50	-	25	
R 121	42.96	Relic	400	Wt	150	-	120	-	25	
A 122	43.35	o Active	100	Grd	1,000	1,000	1,000	600	500	Yes
R 123	43.63	Relic	190	Wt	21	-	0	0	0	
R 124	43.84	Relic	300	Wt	-	0	0	0	0	
B 125	44.30	o Back	25	Trib. Grd	800	630	512	325	325	
F 126	44.40	o Flood	105	None	-	90	18	0	0	
R 127	44.70	Relic	140	Wt	-	110	50	0	0	
R 128	45.25	Relic	155	Wt	-	-	-	0	0	
B 129 lower	45.44	Back	70	None	1,750	1,750	1,300	-	600	
B 129 upper		Relic	360	Wt	0	0	0	0	0	
R 130 lower	45.96	Relic	360	Grd, Wt	-	-	200	150	150	
R 130 upper		Relic	250	Wt	2,500	0	0	0	0	
A 131	47.29	o Active	237	None	1,896	1,696	1,896	1,659	948	Yes

o Met the criteria for analysis.
* See side channel definitions in this report.
** Other sources of water rather than the mainstem of the Cowichan River.
Abbreviations Trib.= Tributary, Grd.= Ground Water, Bd.= Beaver Dams, Wt.= Water Table
*** cms = cubic meters per second, cfs = cubic feet per second, - = no measurement taken, 0 = no water present.

TABLE 2 COWICHAN SIDECHANNEL: TOTAL AREA SUMMARIES

(compiled from Table 1)

FIGURE 5, Sheet 1.
SIDE CHANNEL AREA SUMMARY

SIDECHANNEL TYPE	TOTAL LENGTH (km)	AVERAGE WIDTH (m)	(SHEET 1) TOTAL AREA (m^2)	(SHEET 1+2+3) TOTAL AREA OF ALL SIDE CHANNELS (m^2)	(SHEET 1) PERCENT OF TOTAL AREA (%)
FLOOD	1.6	7.8	12,900	59,700	22
ACTIVE	6.7	8.6	57,300	193,800	30
BACK	4.9	11.0	54,400	65,600	83
RELIC	3.8	12.8	48,600	241,400	20
			173,200	560,500	31

FIGURE 5, Sheet 2.
SIDE CHANNEL AREA SUMMARY

SIDECHANNEL TYPE	TOTAL LENGTH (km)	AVERAGE WIDTH (m)	(SHEET 2) TOTAL AREA (m^2)	(SHEET 1+2+3) TOTAL AREA OF ALL SIDE CHANNELS (m^2)	(SHEET 2) PERCENT OF TOTAL AREA (%)
FLOOD	3.9	8.5	38,000	59,700	55
ACTIVE	5.8	10.5	60,300	193,800	31
BACK	0.1	72.0	7,200	65,600	11
RELIC	4.9	8.2	39,800	241,400	16
			140,300	560,500	16

FIGURE 5, Sheet 3.
SIDE CHANNEL AREA SUMMARY

SIDE CHANNEL TYPE	TOTAL LENGTH (km)	AVERAGE WIDTH (m)	(SHEET 3) TOTAL AREA (m^2)	(SHEET 1+2+3) TOTAL AREA OF ALL SIDE CHANNELS (m^2)	(SHEET 3) PERCENT OF TOTAL AREA (%)
FLOOD	1.7	8.2	13,800	59,700	23
ACTIVE	7.7	9.9	76,200	193,800	39
BACK	0.3	14.7	4,000	65,600	6
RELIC	12.5	12.2	153,000	241,400	63
			247,000	560,500	44

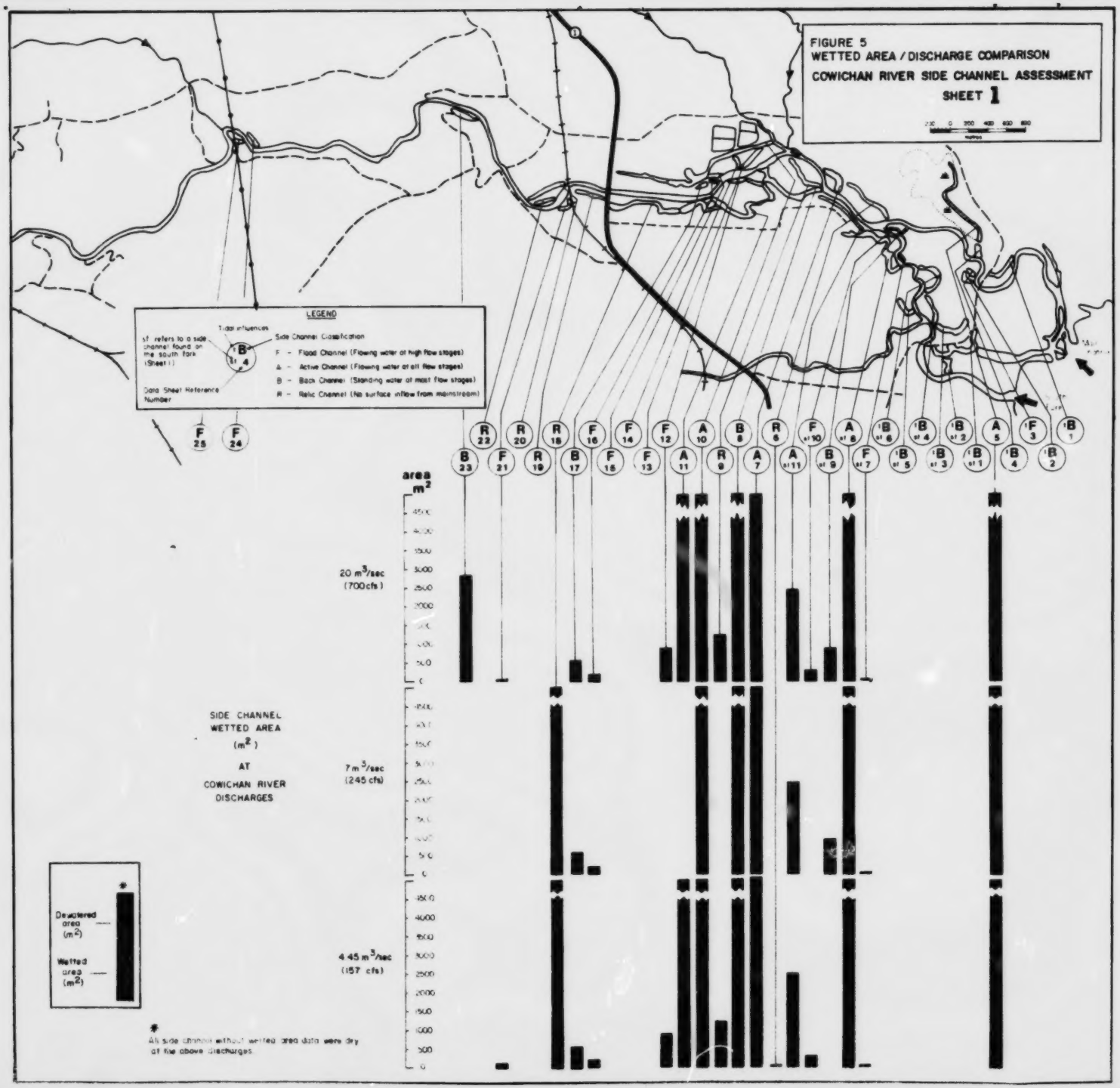


FIGURE 5
WETTED AREA / DISCHARGE COMPARISON
COWICHAN RIVER SIDE CHANNEL ASSESSMENT
SHEET 1
LEGEND
Tidal influences
Side Channel Classification
F – Flood Channel (Flowing water at high flow stages)
A – Active Channel (Flowing water at all flow stages)
B – Back Channel (Standing water at most flow stages)
R – Relic Channel (No surface inflow from mainstream)
Data Sheet Reference Number
area m²
20 m³/sec (700 cfs)
7 m³/sec (245 cfs)
4.45 m³/sec (157 cfs)
SIDE CHANNEL WETTED AREA (m²) AT COWICHAN RIVER DISCHARGES
Dewatered area (m²)
Wetted area (m²)
* All side channels without wetted area data were dry at the above discharges.

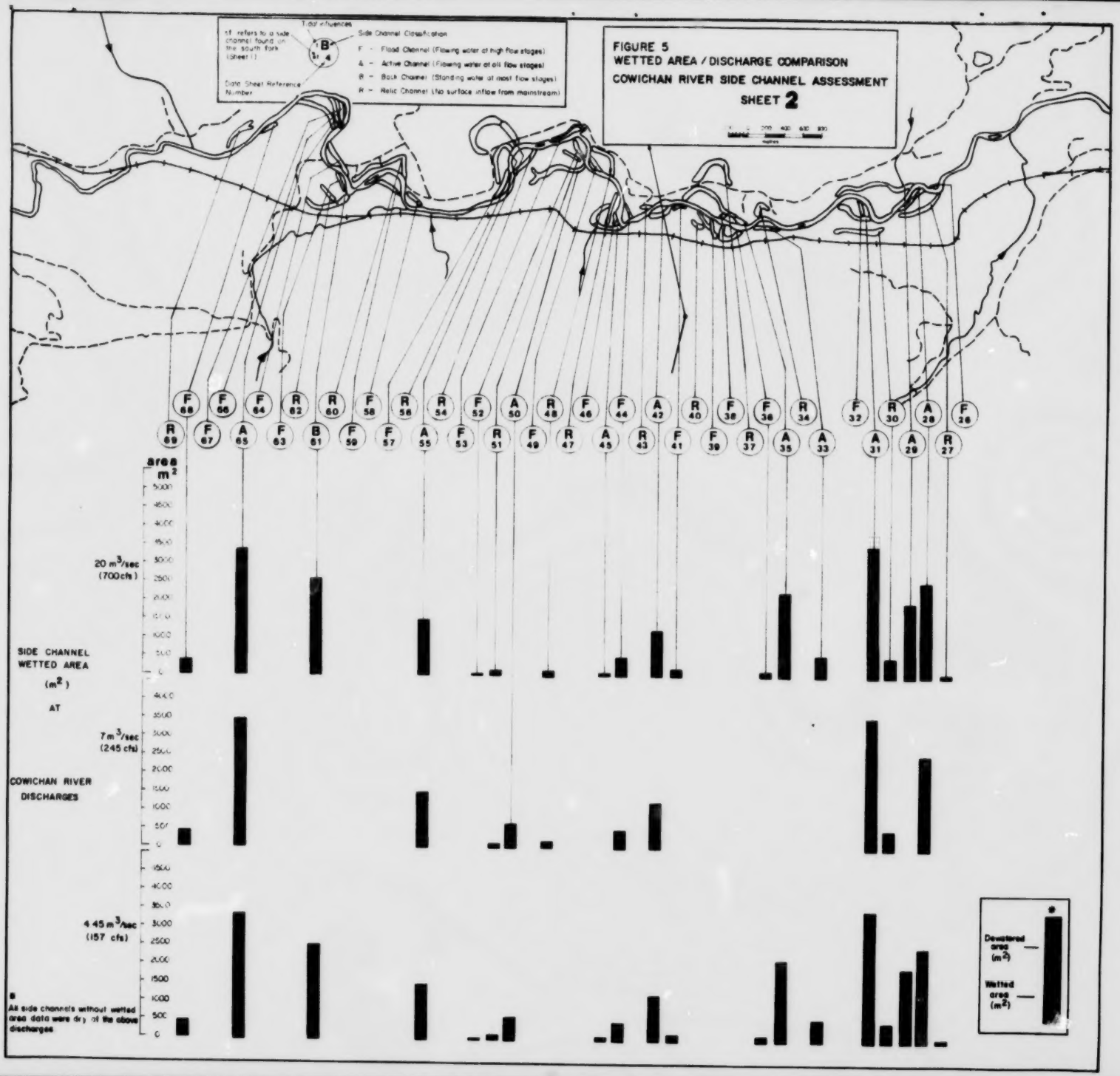
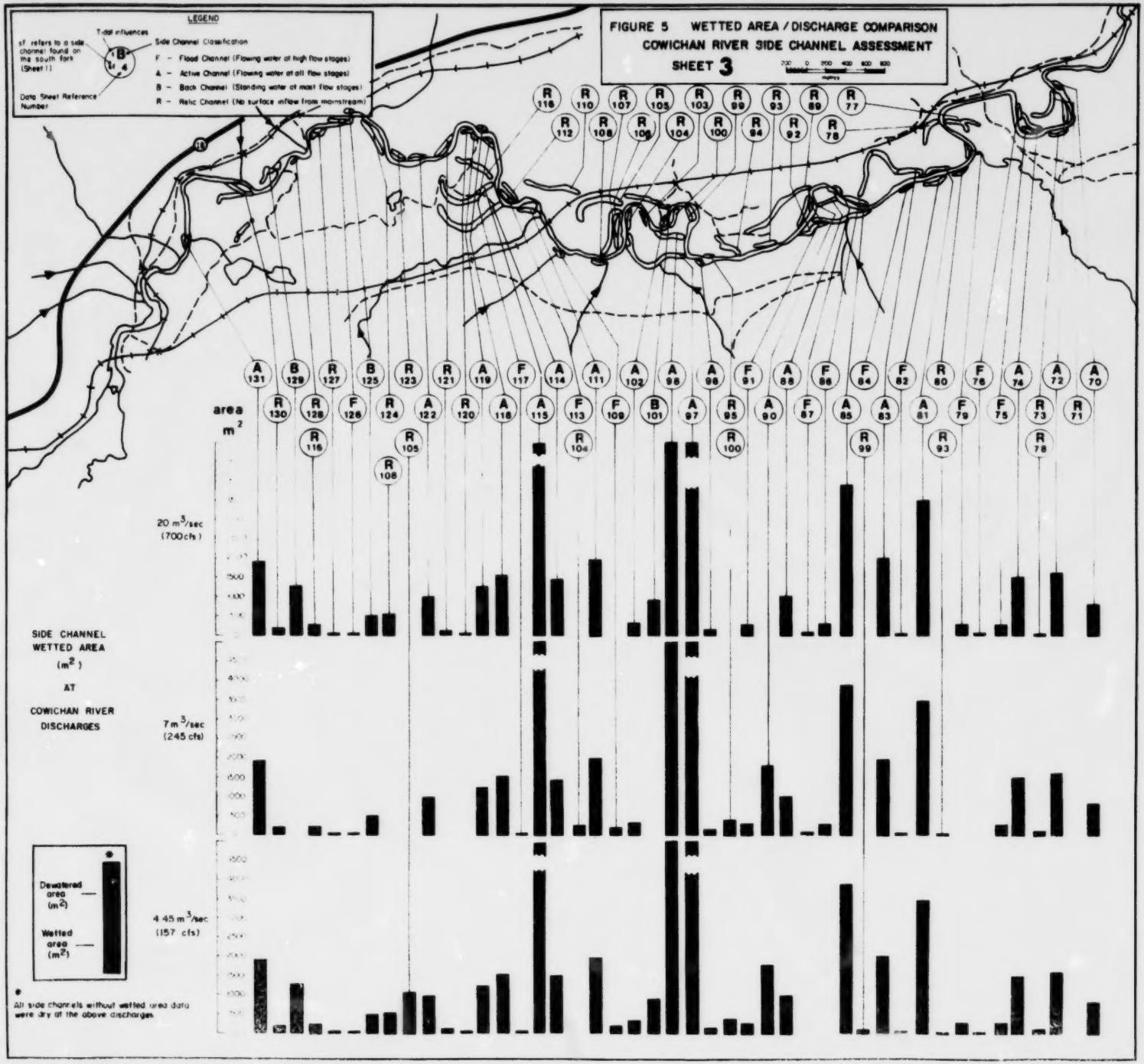


FIGURE 5
WETTED AREA / DISCHARGE COMPARISON
COWICHAN RIVER SIDE CHANNEL ASSESSMENT
SHEET 2
Tidal influences
Side Channel Classification
F - Flood Channel (Flowing water at high flow stages)
A - Active Channel (Flowing water at all flow stages)
B - Back Channel (Standing water at most flow stages)
R - Relic Channel (No surface inflow from mainstream)
Data Sheet Reference Number
SIDE CHANNEL WETTED AREA (m²) AT
COWICHAN RIVER DISCHARGES
20 m³/sec (700cfs)
7 m³/sec (245 cfs)
4.45 m³/sec (157 cfs)
area m²
Dewatered area (m²)
Wetted area (m²)
All side channels without wetted area data were dry at the above discharges


LEGEND
Tidal influences
Side Channel Classification
F – Flood Channel (Flowing water at high flow stages)
A – Active Channel (Flowing water at all flow stages)
B – Back Channel (Standing water at most flow stages)
R – Relic Channel (No surface inflow from mainstream)
Data Sheet Reference Number
FIGURE 5 WETTED AREA / DISCHARGE COMPARISON
COWICHAN RIVER SIDE CHANNEL ASSESSMENT
SHEET 3
area m²
20 m³/sec (700 cfs)
7 m³/sec (245 cfs)
4.45 m³/sec (157 cfs)
SIDE CHANNEL WETTED AREA (m²) AT COWICHAN RIVER DISCHARGES
Dewatered area (m²)
Wetted area (m²)
All side channels without wetted area data were dry at the above discharges.

Bibliography

Burns, T. 1987. Resident trout and salmon fisheries in the upper Cowichan river system: present status and opportunities for enhancement. B.C. Fisheries Br. M.S. report for Vancouver Is. Region, 2569 Kenworth Road, Nanaimo, B.C.

Burns, T., R.A. Bams, T. Morris, T. Field, and B.D. Tutty. 1987. Cowichan watershed fry salvage and coho colonization operations (1986): A review and preliminary results. Can. MS Rep. Aquat. Sci. No. 1949: v + 68p.

Burns, T., L. Nelson, L. Goldsmith, T. Fields, T. Morris, E.A. Harding, and B.D. Tutty. 1988. A detailed salmonid fry salvage plan and coho colonization strategy for the Cowichan River watershed. Can. MS Rep. Aquat. Sci. No. 1985: v + 27p.

Debeck, H.D. 1974. Cowichan Lake water storage regulation - provisional rule curve. B.C. Water Rights Branch.

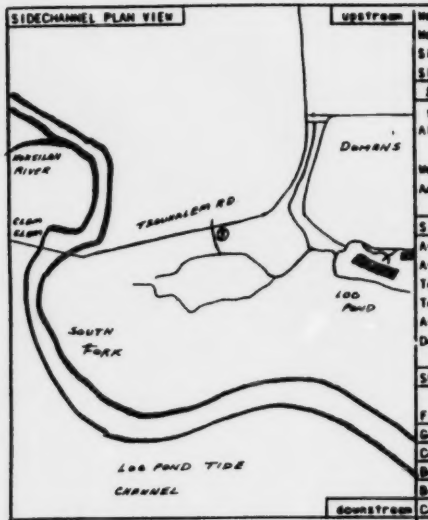
Ministry of Environment and Parks. 1986. Cowichan-Koksilah water management plan - Final report. Vancouver Island Region, Water Management Branch. 2569 Kenworth Road, Nanaimo, B.C.

Acknowledgements

The authors gratefully acknowledge the editorial comments and critical review of the manuscript by Dr. B. Hollingshead, Regional Water Manager, R. Bams of the Pacific Biological Station and R. Higgins - DFO, G. Reid - MOE&P: Fisheries Branch. The manuscript was prepared by S. Theurer with thanks for her creative layout and advice.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: SFB1 NTS Map: 92B/13
Site Location: TRUNKLEM RD
83 | 10 | 23 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line 148, 149 photo nos.
Weather: CLEAR, COOL Air Temp. °C: 10
Access: TRUNKLEM RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	0-10	Total Riffle (%)	
Total Length (m)	1100	Total Run (%)	
Total Wetted Area (m^2)	0-11000	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	100
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	?
Gravel	1
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. SFB1 Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
23/10/83	4	0	1100	0-10	0-11000	11000

FISH UTILIZATION

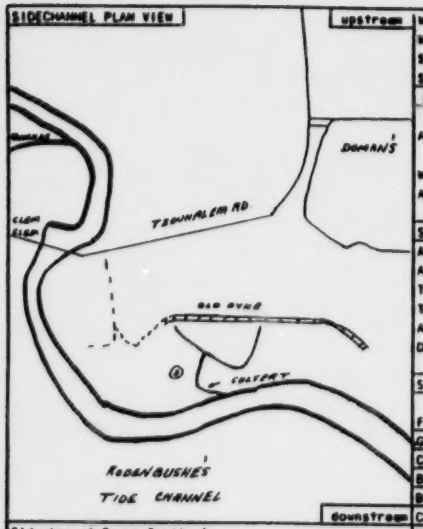
Transient use by chinooks and chums during estuarine phase. NEOMYSIS is very abundant in Domans log storage pond

ENHANCEMENT ASSESSMENT

No evident improvement possibilities

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: SFB2 NTS Map: 92 B/13
Site Location: NEAR CULVERT
86 | 10 | 23 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line 149, 149 photo nos.
Weather: CLEAR, COOL Air Temp. °C: 10
Access: TSOUHALEM RD Water Temp. °C:
DRIVEWAY

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	1	Total Pool (%)	
Avg. Wetted Width (m)	0-1	Total Riffle (%)	
Total Length (m)	340	Total Run (%)	
Total Wetted Area (m^2)	0-2720	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	100
Debris (%)	2	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	98
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. SFB2 — Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
23/10/86	4	0	340	0 - 8	0-2720	2720

FISH UTILIZATION

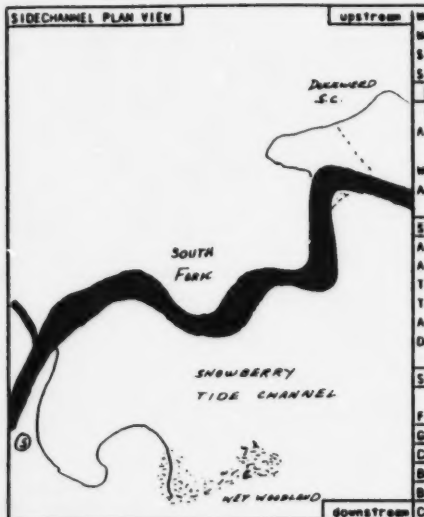
Chum, chinook and coho fry/smolts find their way into this channel long term use is doubtful with the possible exception of watering CAAO.

ENHANCEMENT ASSESSMENT

No improvement opportunities are evident.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: SF83 NTS Map: 92B/13
Site Location: 150 m ABOVE OUTLET
86 | 10 | 23 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line 149 - 149 photo nos.
Weather: CLEAR, COOL Air Temp. °C:
Access: TRANSALPM RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	
Avg. Wetted Width (m)	0 - 8	Total Riffle (%)	
Total Length (m)	840	Total Run (%)	
Total Wetted Area (m^2)	0 - 6720	Total Glide (%)	
Ave. Slope (%)	NIL	Total Slough (%)	100
Debris (%)	15	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M(H)

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

PRIOR TO DYKING THE NORTH FORK, THIS CHANNEL CARRIED NORTH FORK OVERFLOW FOR SEVERAL MONTHS (1977 - 1984) IT IS STILL WETTED BY THE WINTER WATER TABLE AND HAS WATER OF ITS OWN UNTIL MAY OR JUNE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. SF83 Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
23/10/86	4	0	840	0 - 8	0 - 6720	6720

FISH UTILIZATION

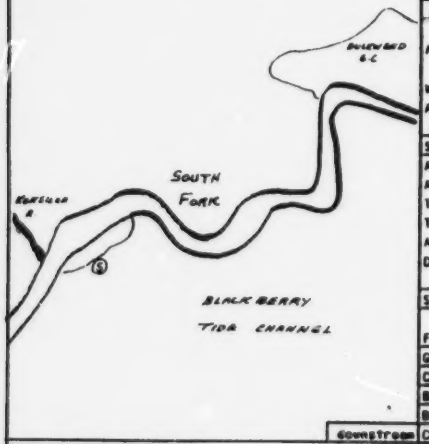
Possibility of wintering coho

ENHANCEMENT ASSESSMENT

No evident improvement possibilities.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: SF B4 NTS Map: 92 B/13
Site Location: 50m ABOVE OUTLET
96 | 10 | 25 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line 148, 149 photo nos.
Weather: CLEAR, COOL Air Temp. °C: 10
Access: TRANSALPINE RD., ACROSS FIELDS Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	1	Total Pool (%)	
Avg. Wetted Width (m)	0-8	Total Riffle (%)	
Total Length (m)	320	Total Run (%)	
Total Wetted Area (m^2)	0-1760	Total Glide (%)	
Ave. Slope (%)	.00001	Total Slough (%)	100
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	2
Cobbles	6
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

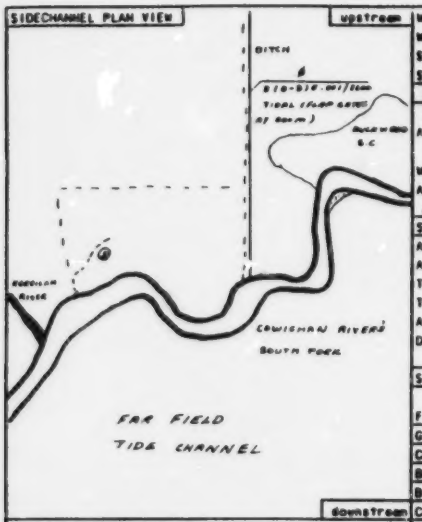
Sidechannel No. SFB4 / Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
23/10/97	4	0	320	0-8	0-1760	1760

FISH UTILIZATION: none

ENHANCEMENT ASSESSMENT: no improvement possibilities

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: SFBS NTS Map: 92/8/12
Site Location: MEAN HEAD
96 / 10 / 20 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 894 flight line photo nos.
Weather: CLEAR / COOL Air Temp. °C: 10
Access: GOV'T RD TO BOUNDARY Water Temp. °C: 12
FROM HOBBY MEADOW FIELDS

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	0-10	Total Riffle (%)	
Total Length (m)	155	Total Run (%)	
Total Wetted Area (m^2)	0-1550	Total Glide (%)	
Ave. Slope (%)	000 /	Total Slough (%)	100
Debris (%)	15	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	1
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M (H)

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

TIDE CHANNEL WETTED BY TIDAL SURGE AND DEPLETED BY TIDAL EBB SOME WINTER BACKFLOODING FROM THE RIVER

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. SFBS Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
23/10/96	4	0	155	0-10	0-1550	1550

FISH UTILIZATION

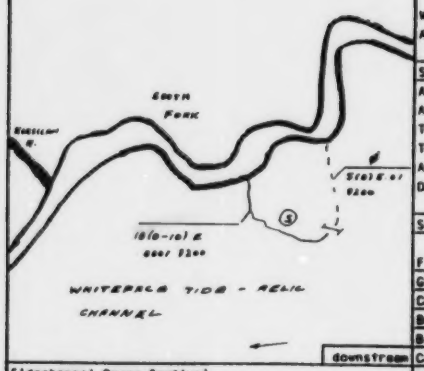
None other than the possibility of a few overwintering coho

ENHANCEMENT ASSESSMENT

No improvement possibilities

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: SFB6 NTS Map: 92 B/13
Site Location: CENTRAL
86 | 10 | 15 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 564 flight line 148, 149 photo nos.
Weather: CLEAR, COOL Air Temp. °C: 10
Access: CATTLE TRAILS FROM TRANSLEAM RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	7.5	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	480 (e)	Total Run (%)	
Total Wetted Area (m^2)	0 - 3600	Total Glide (%)	
Ave. Slope (%)	.0001	Total Slough (%)	100
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream Comparison Hill L R H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY TIDAL SURGE AND WINTER BACKFLOODING, OTHERWISE DRY AND ALMOST ALWAYS DRY IN THE UPPER 200 M WHICH IS RELIC AND SOMEWHAT DYKED

SIDE CHANNEL ASSESSMENT SUMMARY

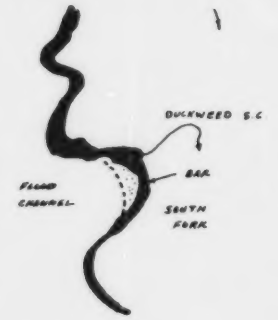
Sidechannel No. SFB6	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
Day/Month/Year						
15/10/86	5 5	0	480(e)	7 5	0	3600

FISH UTILIZATION: None

ENHANCEMENT ASSESSMENT: No viable enhancement options

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: CONGLOMAN

Watershed Code:

Sidechannel No.: SF7F NTS Map: 92 B/13

Site Location: SOUTH FORK BAR

17 | 6 | 12 Time: ____ Agency: ____ Crew: TB

yr mo day

Air Photo Location No.: BCC 394 148, 149

flight line photo nos.

Weather: CLOUDY, WARM Air Temp. °C: 21

Access: NORTH FORK DYKE Water Temp. °C: 21

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	7	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	100	Total Run (%)	
Total Wetted Area (m^2)	17	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

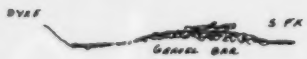
	%
Fines	3
Gravel	7
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

Compaction NIL L (M) H

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary	
Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

THREE POOLS REMAIN 1.5 x 1.5 x 1.5 = 17m°

THE BAR AND CHANNEL ARE INUNDATED IN HIGH FLOWS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. SF7F / Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
12/6/87	20	0	100	.014	17	700
21/7/87		0			0	700

FISH UTILIZATION

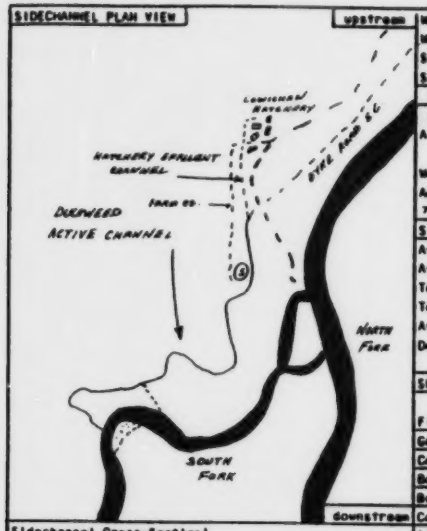
This channel is inundated in high flows and dries quickly with falling river levels, it doesn't attract many fish. a few coho and chum fry may be trapped in some years.

ENHANCEMENT ASSESSMENT

No improvement possible

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: SFA8 NTS Map: 92 B/15
Site Location: CENTRAL
17 | 8 | 10 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line: 147-149 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 35
Access: BOYS RD., DYKE RD. Water Temp. °C: 17
To hatchery then above weir field edge

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	100
Avg. Wetted Width (m)	11	Total Riffle (%)	
Total Length (m)	785	Total Run (%)	
Total Wetted Area (m^2)	9635	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	5
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil (1) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

WETTED BY

1 WINTER WATER TABLE

2 SEEPAGE FROM MAJOR JIMMY'S

3 HATCHERY EFFLUENT (SUMMER FLOW IS GREATLY REDUCED WHEN THE HATCHERY IS NOT OPERATING)

4 BACKFLOODING ESPECIALLY DURING HIGH FLOW - HIGH TIDES

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. SFA8

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
23/10/86	4	.08	785	15	11775	11775
2/4/87	44	.35	785	15	11775	
8/5/87	30	.29	785	15	11775	
24/5/87	19	.09	785	15	11773	
31/7/87		0	785	12	9420	
10/9/87	9.48	0	785	11	8635	
4/2/88		.31	785	15	11775	

FISH UTILIZATION

Coho and chum spawning; coho rearing and wintering.

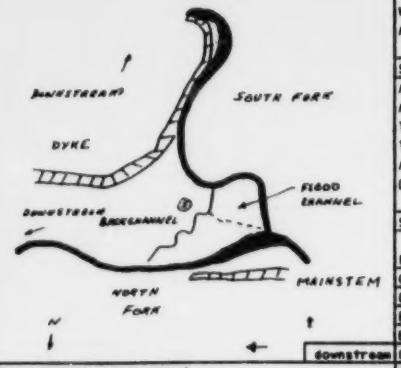
ENHANCEMENT ASSESSMENT

Part of the South Side Sidechannel Complex (Down River). By providing flow at the head of the Silver Bridge Relic Channel, 45,932 m^2 of additional summer wetted area could result; Duckweed would add 3140.

This improvement is discussed in more detail on: 14R.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No. SF9B NTS Map: 92B/13
Site Location
Time: ____ Agency: ____ Crew: TB
yr mo day: 17 | 6 | 12
Air Photo Location No. BC 594 148 - 149 (flight line / photo nos.)
Weather: CLOUDY, WARM Air Temp. °C: 21
Access: OFF END OF DYKE Water Temp. °C: 10

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	4	Total Riffle (%)	
Total Length (m)	150	Total Run (%)	
Total Wetted Area (m^2)	600	Total Glide (%)	
Ave. Slope (%)	.0001	Total Slough (%)	100
Debris (%)	10	Turbidity (cm)	
		Total	100%

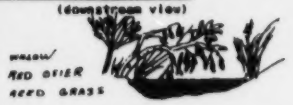
SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction NIL L M(H)

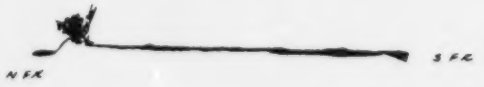
Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)



Comments:

TIDAL

SIDE CHANNEL ASSESSMENT SUMMARY

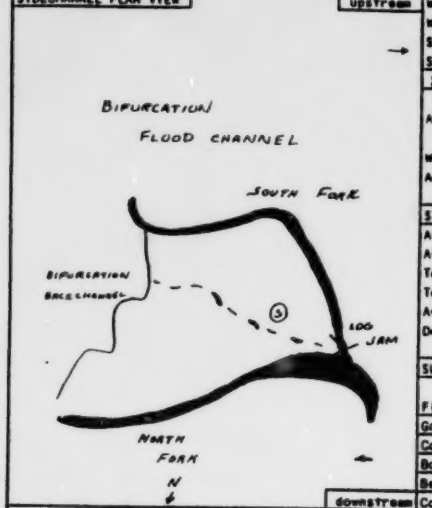
Sidechannel No. SF9B / Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge TIDAL (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
15/5/92		0	150	4	600	900
12/6/87	30	0		6	900	
2/8/87	9.45	0		4	600	

FISH UTILIZATION: coho rearing and wintering

ENHANCEMENT ASSESSMENT: no improvement required

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: SF10F NTS Map: 92 B/13
Site Location: CENTRAL
97 / 6 / 12 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BC 394 flight line 148, 149 photo nos.
Weather: CLOUDY; WARM Air Temp. °C: 21
Access: OFF DYKE FROM PIMBURY OR WADE RIVER Water Temp. °C: 14

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	150	Total Run (%)	
Total Wetted Area (m^2)	310	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	2	Turbidity (cm)	NIL
		Total	100%

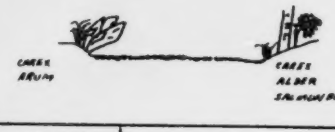
SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	7
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

THREE POOLS REMAIN 10 m^2, 200 m^2 AND 100 m^2

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. SF10F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
13/3/92	40	.03	150	0	900	1500
12/6/17	20	0		.6	310	
7/8/17	4.45	0		.03	45	

FISH UTILIZATION

Coho salmon in the channel and attempt to rear in it. Wetted area is drastically reduced when mainstem flows fall to summer levels. Many fry are lost during this period.

ENHANCEMENT ASSESSMENT

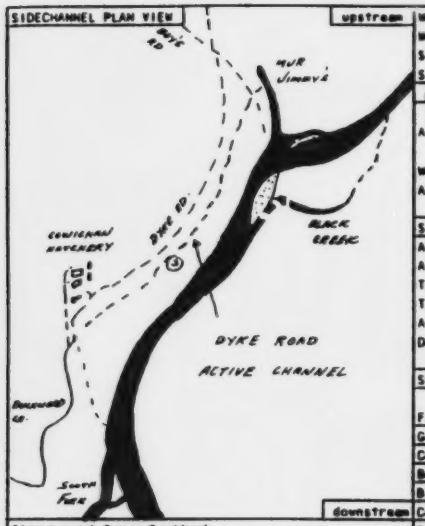
Excavation of a deep pool near the inlet and periodic flushing of the lower channel would provide permanent rearing

Wetted area increase = 155 m^2

Yield potential = 273 CO smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: SF11A NTS Map: 92 B/13
Site Location: CENTRAL
87 | 9 | 2 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line 147, 148 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 34
Access: DYKE RD. Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	410 (0)	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	5
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE AND SEEPAGE FROM MAJOR JIMMY'S SLOUGH. PRIOR TO THIS SUMMER, I HAD NEVER SEEN THIS CHANNEL DRY. STAGNANT APPEARING AND INTERMITTANT BUT MORE WET THAN DRY. HIGH Fe CONTENT IN AREA. FLOW INFLUENCED BY TIDES.

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No.: SF11A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
30/9/86	7.09	0	410	1	410	3050
2/4/87	44	.096	610	5	3050	
9/5/87	30	.022	610	45	2754	
24/5/87	19	.0041	610	4	2440	
30/7/87		0	300	1	300	
8/8/87	4.45	0	0	0	0	
4/2/88		.052	610	5	3050	

FISH UTILIZATION

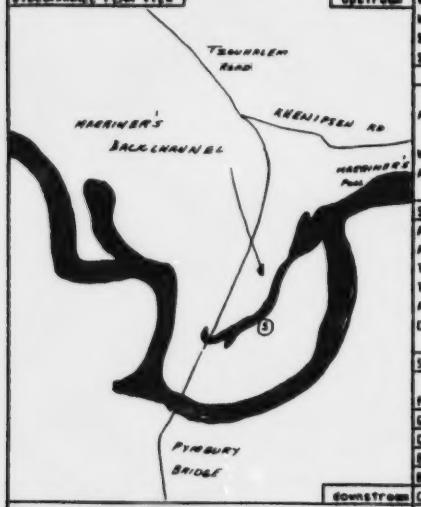
Coho and chum spawning, coho rearing (spring, early summer) and overwintering. May coho densities are as high as 7/m^2 in this channel and salvage is required. Possible yield: 21,350

ENHANCEMENT ASSESSMENT

Part of the South Side Sidechannel Complex

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 18 NTS Map: 92B/13
Site Location: 150 m BELOW HEAD
87 | 6 | 12 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line: 147, 149 photo nos.
Weather: CLEAR Air Temp. °C: 25
Access: TSOUHALEM RD. Water Temp. °C: 16

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	
Avg. Wetted Width (m)	15	Total Riffle (%)	
Total Length (m)	350	Total Run (%)	
Total Wetted Area (m^2)	5250	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	100
Debris (%)	5	Turbidity (cm)	N/A
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 18 Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
12/6/87	Tidal	Tidal	350	15	5250	5250

FISH UTILIZATION

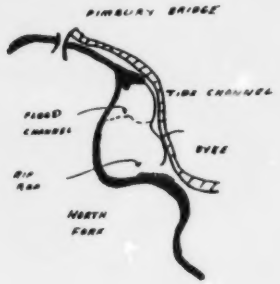
Possibility of summering coho, coho rearing.

ENHANCEMENT ASSESSMENT

No improvement required.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



TIDE CHANNEL

N

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 2B NTS Map: 92 B/13
Site Location: NEAR OUTLET
87 | 6 | 12 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 394 (flight line) 147, 149 (photo nos.)
Weather: CLOUDY, MILD Air Temp. °C: 21
Access: FROM DYKE NEAR DUNCAN BRIDGE Water Temp. °C: 15

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	
Avg. Wetted Width (m)	4	Total Riffle (%)	10
Total Length (m)	210	Total Run (%)	
Total Wetted Area (m^2)	840	Total Glide (%)	
Ave. Slope (%)	.001	Total Slough (%)	90
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

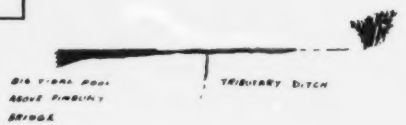
Compaction Nil L M (H)

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	TIDAL
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	20

Gradient Profile: Longitudinal)



Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 2B

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
TIDAL						

FISH UTILIZATION

No salmonids have been observed in this channel. It becomes very low during low tide and even dries up in places in the summer. It carries more water in the winter and may support coho then.

ENHANCEMENT ASSESSMENT

No enhancement required.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 3F NTS Map: 92 B/13
Site Location:
87 | 6 | 12 (yr mo day) Time: Agency: Crew: TG
Air Photo Location No.: BCC 394 — flight line: 147, 149 — photo nos.
Weather: CLOUDY, WARM Air Temp. °C: 21
Access: FROM BYES NEAR PINBURY BRIDGE Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	160	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments:

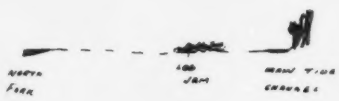
downstream

Compaction Hi L M(H)

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)



Comments:

ONLY WETTED AT HIGH FLOWS — HIGH TIDES

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 3F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
TIDAL						

FISH UTILIZATION

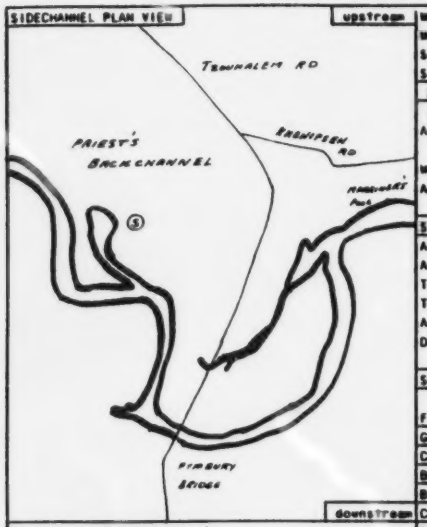
None seen more possible transient use by coho fry.

ENHANCEMENT ASSESSMENT

None evident

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 4B NTS Map: 92 B/15
Site Location: NEAR HEAD
97 | 6 | 12 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 894 flight line 148, 149 photo nos.
Weather: CLOUD AND SUN Air Temp. °C: 25
Access: TSOUHALEM RD Water Temp. °C: 13

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	30	Total Pool (%)	
Avg. Wetted Width (m)	30	Total Riffle (%)	
Total Length (m)	200	Total Run (%)	
Total Wetted Area (m^2)	6000	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	100
Debris (%)	5	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	5
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 4B Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
	TIDAL	TIDAL	200	30	6000	6000

FISH UTILIZATION

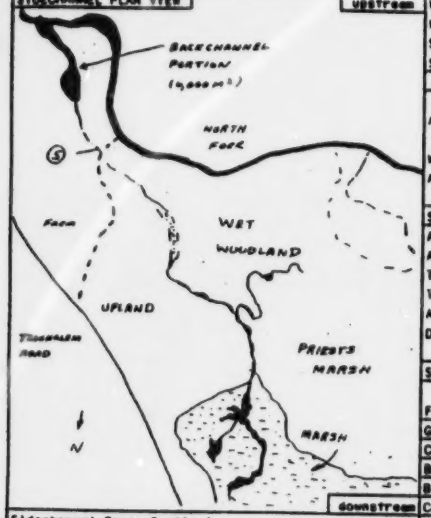
Coho rearing and wintering.

ENHANCEMENT ASSESSMENT

No improvement required

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 5A NTS Map: 92 B/13
Site Location: 300 m ABOVE OUTLET TO BACKCHANNEL PORTION
17 / 6 / 12 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 594 flight line: 148, 149 photo nos.
Weather: CLOUDY/SUN Air Temp. °C: 22
Access: FOOT TRAIL FROM TRANSALEM RD. THROUGH FIELD Water Temp. °C: 13

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	100	Total Pool ($)	
Avg. Wetted Width (m)	30	Total Riffle ($)	
Total Length (m)	1800	Total Run ($)	
Total Wetted Area (m²)	45000	Total Glide ($)	
Ave. Slope ($)	.001	Total Slough ($)	100
Debris ($)	NA	Turbidity (cm)	
		Total:	100$

SUBSTRATE COMPOSITION

	$
Fines	9
Gravel	1
Cobbles	0
Boulders	0
Bedrock	0

Comments:

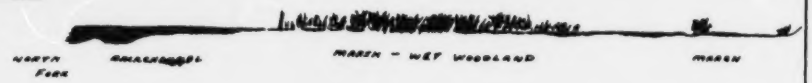
Compaction: Nil L M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	NA
Wetted Width (m)	NA
Avg. Depth (cm)	NA
Wetted X-Sec Area (m²)	.018
Avg. Velocity (m/sec)	.18
Flow (m³/sec)	.0018 (.048 cfs)
Mainstem Discharge (m³/sec)	20

Gradient Profile: Longitudinal)



Comments:

NOT A TRUE SIDECHANNEL; BEST DESCRIPTION A BACKWATER MARSH - WET WOODLAND COMPLEX WETTED MAINLY BY THE WINTER WATER TABLE. THIS SYSTEM IS LARGELY INDEPENDENT OF RIVER FLOW

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 5A Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
12/6/87	20	.0015	1800	30	45000	UNKNOWN
30/7/87		0		28	42000	
29/5/86	35	.003		30	45000	
10/5/87	448	0		25	37500	
19/12/86		.5		30	45000	

FISH UTILIZATION

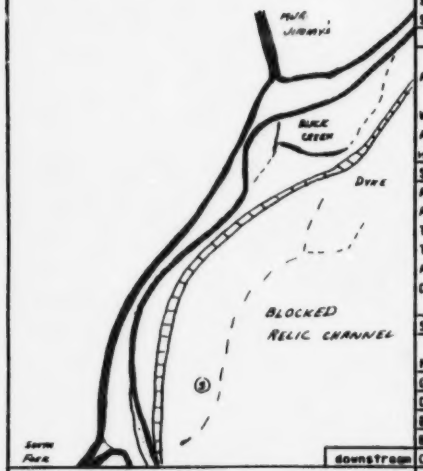
Coho summer rear and overwinter in the back channel portion. It is suspected that many also winter upstream in the marsh - wet woodland section of this complex. Holtby found densities of 6.18 co./m² and .11 co./m² in Dec. 1986

ENHANCEMENT ASSESSMENT

Dredging a high area about 200 m above the backchannel may provide better egress for coho that might winter in the upper part of the complex.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 6R NTS Map: 92 B/13
Site Location:
87 | 9 | 8 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC flight line: 147, 148 photo nos.
Weather: CLOUD, HOT Air Temp. °C: 35
Access: TRANSMITH RD., HARMICHAN Water Temp. °C: 20
VILLAGE RD., DYKE RD.

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	750	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.001	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M (H)

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal

Comments:

WETTED BY WINTER WATER TABLE.

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 6R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
14/10/86	4	0	750/10	2	20	11250
2/4/87	44	0	700	5	3500	
24/5/87	30	0	30	3	90	
3/8/87	948	0	10	2	20	

FISH UTILIZATION

None. Channel is inaccessible and does not hold water long enough to be a production factor.

ENHANCEMENT ASSESSMENT

If Black Creek could receive permanent flow, a diversion to this channel would be beneficial. The outlet requires a culvert under the dyke. At the very least, the channel could provide cover for

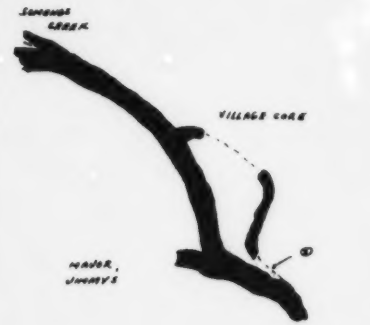
Wetted area increase = 11250

Fish potential = 11250 @ 50 SMOLTS

A drain under the upper dyke and some excavation of the upper channel area is also necessary.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



QUAMICHAN VILLAGE SIDECHANNEL
(BLACK CREEK)

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 7A NTS Map: 92 B/13
Site Location: NEAR OUTLET
97 | 7 | 24 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 394 flight line 135, 136 photo nos.
Weather: CLOUDY, SHOWERS SHOWERS Air Temp. °C: 22
Access: TRANSMOUNTAIN, QUAMICHAN VILLAGE RD., DYKE RD. Water Temp. °C: 21

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	13	Total Pool (%)	
Avg. Wetted Width (m)	4.76	Total Riffle (%)	
Total Length (m)	400	Total Run (%)	
Total Wetted Area (m^2)	1860	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	100
Debris (%)	1	Turbidity (cm)	8M
		Total	100%

SUBSTRATE COMPOSITION

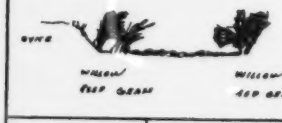
	%
Fines	2
Gravel	8
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction: NIL L (M) H

downstream

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

A MAJOR SIDECHANNEL THAT I THOUGHT NEVER DRIED. IT WAS FLOWING AT .3 CMS AT MINIMUM RIVER FLOW IN 1986. EITHER ITS INLET BERM INCREASED IN ELEVATION AND COMPACTION LAST WINTER (UNLIKELY) OR RECENT HIGH EVAPOTRANSPIRATION (ETP) HAS CAUSED ABNORMAL DRYING

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 7A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
14/10/86	6	.30	400	.4	5600	6000
2/5/87	44	6.00		15	6000	
3/5/87	29	2.77		15	6000	
24/5/87	21	.84		14	5600	
24/7/87		3.47		4.76	1860	
30/7/87		0	100	10	1000	
8/8/87	4.48	0	90	9	810	
2/9/86	9.0	.5	400	13.5	5000	

FISH UTILIZATION

Coho and chums spawn in this channel along with occasional steelhead and chinooks. Coho likely overwinter, steelhead may too. Chum and chinook fry and coho and steelhead smolts leave well before drying but some coho fry are trapped, mainly in the large pool. They probably survive

1986 FRY DENSITIES (FROM HOLTBY, PERS COMM)

2/9/86	16/12/86
CO 1.79	.014
CH .019	CHOOK .004

ENHANCEMENT ASSESSMENT

Permanent wetting could easily be provided via a French Drain or buried waterline.

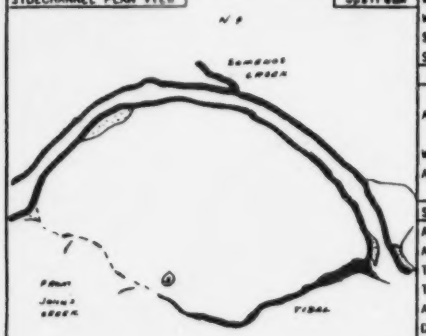
Wetted area increase = 5190 m^2

Fwild potential = 1660 CO SMOLTS

1 Pisces 18 unidentified adult trout

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 18 NTS Map: 92 B/13
Site Location: 600 M ABOVE CONFLUENCE
87 / 7 / 30 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line 138, 136 photo nos.
Weather: MOSTLY CLOUDY Air Temp. °C: 17
Access: OFF OYSTER RD FROM BOYD RD Water Temp. °C: 13

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	14	Total Pool (%)	38
Avg. Wetted Width (m)	6.8	Total Riffle (%)	
Total Length (m)	583	Total Run (%)	
Total Wetted Area (m^2)	4000	Total Glide (%)	
Ave. Slope (%)	0.5	Total Slough (%)	62
Debris (%)	2	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	2	
Gravel	7	
Cobbles	1	
Boulders	0	
Bedrock	0	

downstream Compaction NIL (D) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary — SIGNIFICANT FLOWS ABOVE 600M

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (m)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 18

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
2/4/87	40	2.7	876	14	12244	12264
1/5/87	30	.66	876	8	7001	
24/5/87	20	.12	876	7.5	6570	
29/6/87	19	10	876	7.5	6570	
30/7/87		0	513	6.9	4000	
9/9/87	447	0	580	6.15	3572	

FISH UTILIZATION

Coho and chum spawning, steelhead also said to spawn here. Coho rearing and overwintering

Summer and winter fry densities (No./100 sq. m. cover)

Upper Site: Sept 17/86 Co 14/m^2 St/Cl 8.1/m^2
Dec 9/86 not calculated

Lower Site: Sept 17/86 3.62 m^2 .18/m^2
Dec. 9/86 .29 m^2 .02/m^2

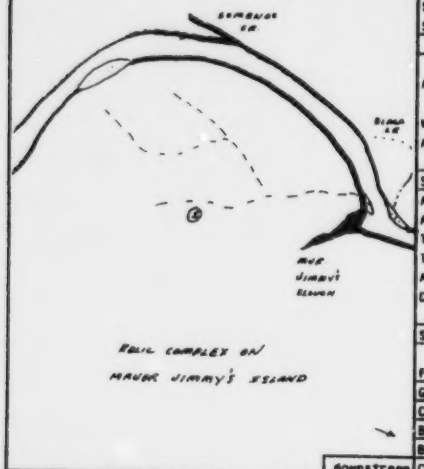
ENHANCEMENT ASSESSMENT

Part of the lower Koksilah South Side Complex. By providing additional summer flow at its uppermost part (Silver Bridge Relic Channel), 45982 m^2 more summer wetted area would result in the six channels that make up the complex.

Major Jimmy's would gain 8692 m^2

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name CONICHAN

Watershed Code

Sidechannel No. 9R NTS Map: 92 B/13

Site Location NEAR HEAD OF MAINCHANNEL

97 | 5 | 9 Time Agency Crew TB
yr mo day

Air Photo Location No. BCC 394 135, 136
flight line photo nos.

Weather CLEAR, HOT Air Temp. °C 34

Access BOYD RD., LOGG MAIN Water Temp. °C

JIMMY'S HARBOR @ BYRD RD ALLEY, DOWNHILL TWO MONTH

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	7	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	1000 (+)	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.001	Total Slough (%)	
Debris (%)	75	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

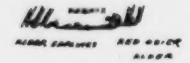
	%
Fines	0
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

GRAVEL UNDERNEATH

Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

WETTED BY

1. BACKFLOODING (LOWER 200 M)
2. WINTER WATER TABLE
3. OCCASIONAL SPILL FROM THE MAINSTEM IN LARGE FLOODS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 9R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length 1000 (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/5/97	30	0	400	4	1600	7000
24/5/97	20	0	400	3	1200	
9/8/97	945	0	0	0	0	

FISH UTILIZATION

Coho overwintering and spring rearing

ENHANCEMENT ASSESSMENT

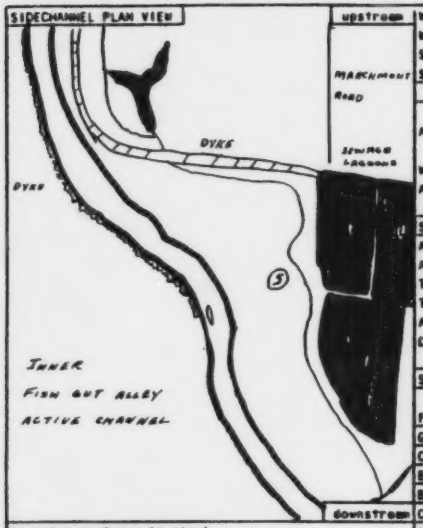
Excavation from the mainstem could result in permanent flow which would benefit coho and chum salmon. Chinook rearing should also benefit.

Wetted area increase = 7000 M^2

Yield potential = 2240 co smolts
1120 ch smolts
3,500,000 cm Fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 10A NTS Map: 92 B/16
Site Location: CENTRAL
17 / 8 / 87 Time: Agency: Crew: TA
yr mo day
Air Photo Location No.: BCC 394 136 ; 137
flight line photo nos.
Weather: CLEAR, HOT Air Temp. °C: 33
Access: MARCHMONT RD. Water Temp. °C: 18
NEWAGE LOOKING DYKE

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	62
Avg. Wetted Width (m)	2	Total Riffle (%)	12
Total Length (m)	1200	Total Run (%)	
Total Wetted Area (m^2)	2400	Total Glide (%)	26
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

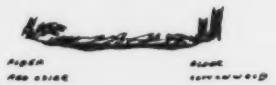
SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	6
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction Nil (1) M H

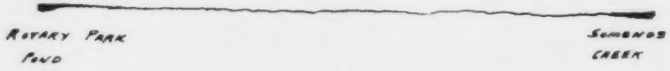
Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	Float
Channel Width (m)	2
Wetted Width (m)	1.7
Avg. Depth (cm)	.085
Wetted X-Sec Area (m^2)	.14
Avg. Velocity (m/sec)	.17
Flow (m^3/sec)	.019 (.67 cfs)
Mainstem Discharge (m^3/sec)	4.45

Gradient Profile:
Longitudinal



Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 10A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
14/10/86	6	.12	1200	6	7200	12000
2/4/87	44	.649	1200	10	12000	
1/5/87	30	.20	1200	8	9600	
24/5/87	19	.145	1200	6	7200	
30/7/87		.058	1200	5	6000	
3/8/87	4.45	.019	1200	2	2400	
16/10/87		76	1200	10	12000	

FISH UTILIZATION

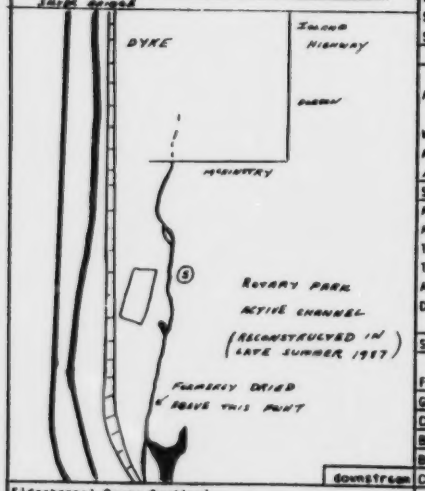
Coho and chum spawning ; coho rearing and overwintering

ENHANCEMENT ASSESSMENT

Wetted area has been increased by 9600 M by deepening Rotary Park channel.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No. 10A (10A/10km) NTS Map: 92 B/9
Site Location: FIRST BRIDGE
97 | 7 | 30 Time: Agency: Crew: TH
yr mo day
Air Photo Location No. BCC 394 flight line 137, 138 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 26
Access: BELOW C MARINEWAY Water Temp. °C:
ROADS

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	600	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	1	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	7
Cobbles	1
Boulders	0
Bedrock	0

Comments:

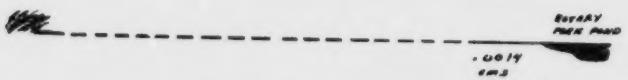
Compaction Nil (1) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)



Comments:

THIS ASSESSMENT PROVIDES BEFORE AND AFTER DATA ON THIS CHANNEL WHICH WAS DEEPENED AND SLIGHTLY WIDENED LATE THIS SUMMER AS DYKING MITIGATION. 3000 m^2 OF PERMANENT HABITAT WAS GAINED IN ROTARY PARK CHANNEL ALONG WITH APPROXIMATELY 7500 m^2 IN FISH GUT ALLEY.

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 10A Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area 1 (m^2)	Optimum	
2/4/97	44	.077	600	4	2400	3000	PLUS 20 OF LOW- AND 37 m^2 OF AREA (I PARK PON
1/5/97	30	.11	600	4	2400		
24/5/97	19	.00032	600	2	1200		
30/7/97	7	0	50	2	100		
10/10/97		.095	600	5	3000		

FISH UTILIZATION

Coho and chum spawning. Prior to enhancement, 1000 - 5000 coho were trapped and required salvage (Burns et al 1997; Elliot, 1997)

Coho also overwinter in this channel. 10,579 smolts were produced in 1996 and 19,121 in 1995. However, most come from the pond and below which is Fish Gut alley.

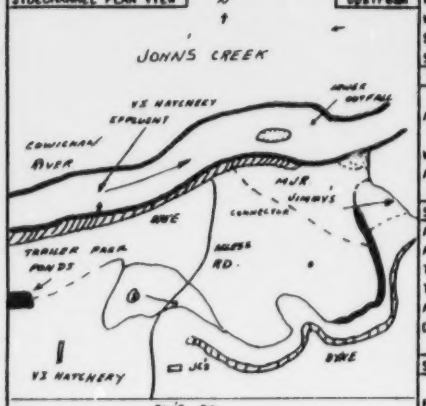
ENHANCEMENT ASSESSMENT

Wetted area was increased by 3000 m^2 by deepening and widening the channel. The improved area is best described as slow pool or glide. Velocity was .056 m/sec on Oct 10, 1997

1 Also a .575 hectare pond which adds 5750 m^2 of wetted area and 300 m of length

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: IIA NTS Map: 92 B/13
Site Location: BEHIND JOHN CHARLIE'S
87 | 6 | 29 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 344 flight line: 146 - 147 photo nos.
Weather: CLEAR WARM Air Temp. °C: 26
Access: ROAD FROM JCL'S VIA BOYS RD Water Temp. °C: 16.5 AT RD. 15.6, 22.5 IN SLOUGH SECTION

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	39
Avg. Wetted Width (m)	5	Total Riffle (%)	10
Total Length (m)	1600	Total Run (%)	
Total Wetted Area (m^2)	8000	Total Glide (%)	20
Ave. Slope (%)	.01	Total Slough (%)	31
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	8
Cobbles	0
Boulders	0
Bedrock	0

Comments: APPLIES TO UPPER 1100 M - LOWER 500 M IS 8200

Compaction Nil L(M)H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	SUBMAINSTAY STANDING WATER
Mainstem Discharge (m^3/sec)	19

Gradient Profile: Longitudinal)

Comments:

WETTED BY
1 WINTER - SPRING WATER TABLE
2 SPILL FROM THE TRAILER PARK PONDS AT MAINSTEM FLOWS GREATER THAN 60 CMS
3 UNDER THE DYKE SEEPAGE VIA RELIC CHANNELS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. IIA Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
2/4/87	44	0[1]	1600	5	8000	9600
7/5/87	30	0		5	8000	
29/6/87	19	0		5	8000	
1/8/87	448	0		2	3200	
4/2/88		.02[2]		5	8000	

FISH UTILIZATION

Light coho and chum spawning; considerable coho wintering and spring rearing in some years areas may be limited by marginal connection with Major Jimmy's. The lower sections of John's Creek have been excavated on occasion to facilitate access but are subject to plugging due to lack of flushing. Major backhoe work is required to generate access.

ENHANCEMENT ASSESSMENT

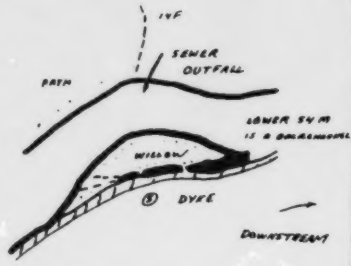
The channel, in combination with the Trailer Park Ponds, Major Jimmy's Slough, Dyke Road and Duckweed Sidechannels has the greatest enhancement potential in the system. If 1 cms could be introduced at the Silver Bridge Relic CH, 15932 m^2 would be enhanced in the complex. Releasing effluent from Vancouver Island Hatchery (1.07 cms, 10°) would also provide considerable benefit by moderating temperatures. It reaches 23° in John's Creek which would benefit by 6400 m^2.

accessing at least one relic flood channel connector (see plan view) may help connect the channel in winter and add 1200 m^2 of summer wetted area. This would require an open ditch under the dyke.

1 measured at road
2 measured at John's

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



JOHNS FLOODCHANNEL

Watershed Name: SQUIGMAN
Watershed Code
Sidechannel No. 12F NTS Map: 92 B/13
Site Location CENTRAL
17 | 6 | 87 Time ____ Agency ____ Crew TB
yr mo day
Air Photo Location No. BCC 384 146, 147
flight line photo nos.
Weather CLEAR, WARM Air Temp. °C 27
Access ALONG DYKE VIA JOHN CHARLIE'S RD Water Temp. °C 24.5 IN INT POOLS, 18 IN GROUNDWATER

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	60
Avg. Wetted Width (m)	6.6	Total Riffle (%)	5
Total Length (m)	138	Total Run (%)	
Total Wetted Area (m^2)	928	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	35
Debris (%)	0	Turbidity (cm)	NIL
		Total	100%

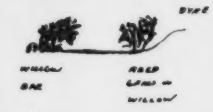
SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	8
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	INT POOLS
Mainstem Discharge (m^3/sec)	19

Gradient Profile: Longitudinal)

Comments:

COHO, CHINOOK AND CHUM FRY ARE HIGHLY ATTRACTED TO THIS CHANNEL BECAUSE ITS BACKWATER SECTION PROVIDES REFUGE IN AN AREA WHERE THERE IS LITTLE. CHINOOKS AND CHUMS LEAVE BEFORE THE POOLS CLOSE BUT MANY COHO ARE TRAPPED. 6000 WERE SALVAGED ON JUNE 25, 1987

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 12F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
13/5/87	29	0	138	7	966	1104
23/6/87	19	0		6.6	912	
8/9/87	449	0		0	0	

FISH UTILIZATION

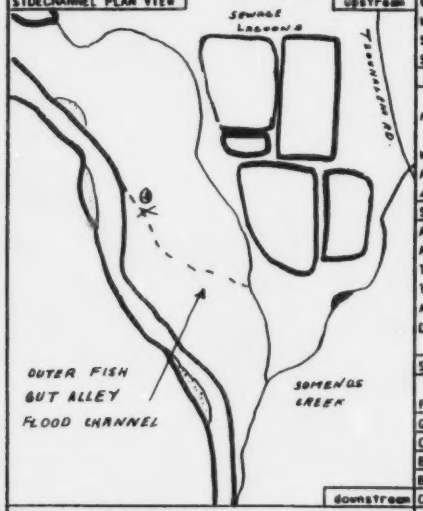
Coho, chinook and chum fry are attracted to this channel's backwater section because it provides refuge in an area when there is little. Chinooks and chums usually leave before the pools close but many coho are trapped. 6000 were salvaged on June 25, 1987.

ENHANCEMENT ASSESSMENT

No enhancement necessary or possible. Annual fry salvage required.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 13F NTS Map: 92 B/13
Site Location: NEAR INLET
17 | 5 | 24 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line 035, 036 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 23
Access: TRANS RD., MARCHMONT, LAGOON RD., FISH GUT CONNECTOR Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	300 (0)	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

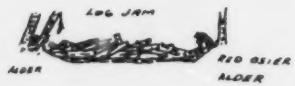
SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	4
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L (M) H

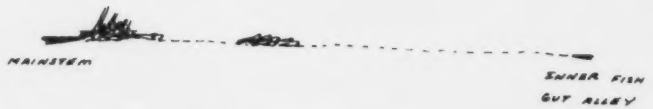
Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)



Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 13F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
21/6/86	7.01	0	0	0	0	2400
2/4/87	44	.61	300	8	2400	
8/5/87	30	.015	300	2.6	780	
14/5/87	19	0	0	0	0	

FISH UTILIZATION

Coho and chum spawning, early chinook and coho rearing. 1000 – 3000 fry are trapped and require salvage

ENHANCEMENT ASSESSMENT

Construction of an improved berm and buried drain could provide permenant flow. This channel is readily accessible and a good one to test improvment methods.

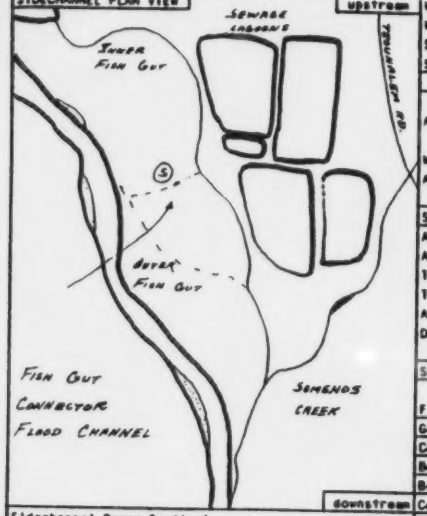
Another possibility is diversion from Inner Fish Gut which can now afford to lose some flow.

Wetted area increase = 2400 m^2

Yield potential = 760 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 14F NTS Map: 92B/13
Site Location: CENTRAL
87 | 4 | 2 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 flight line 133,136 photo nos.
Weather: Air Temp. °C:
Access: Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	100
Avg. Wetted Width (m)	2	Total Riffle (%)	
Total Length (m)	(900)	Total Run (%)	
Total Wetted Area (m^2)	20	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	1	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	7
Cobbles	0
Boulders	0
Bedrock	0

Comments: A THIN VENEER OF GRAVEL OVER CLAY

Compaction NIL (LOW) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 14F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
2/4/87	44	0	10	2	20	950
8/5/87	30	0	0	0	0	

FISH UTILIZATION

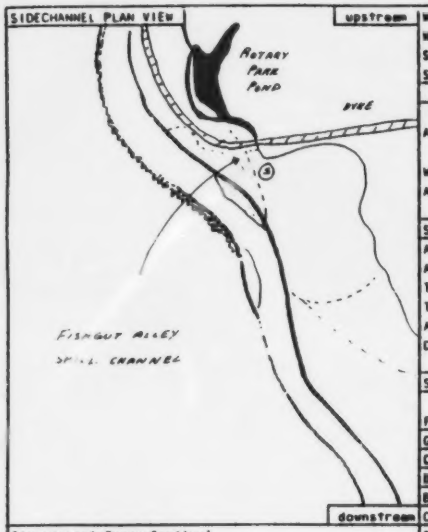
Coho, chinook and chum fry find their way into this channel and become trapped requiring salvage. 500 chums and 25 chinooks were taken on April 2, 1987. However, recent cat work has filled the pools; future salvage may not be necessary because of this and the possibility of permenant flow.

ENHANCEMENT ASSESSMENT

If permenant flow can be achieved in outer Fish Cut, the same can be done for this channel with the installation of a porous weir berm of 20 to 30 cm diameter angular rock. The present berm is too unstable to control high flows.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 15F NTS Map: 92 B/13
Site Location:
87 | 8 | 4 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: 30C 394 (flight line) 136, 137 (photo nos.)
Weather: CLEAR, WARM Air Temp. °C: 25
Access: MCKINSTRY RD. Water Temp. °C:
DYKE

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	220	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	15	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	4
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction NIL L (M) H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

A FORMER SPILL CHANNEL FROM ROTARY PARK POND, FISH GUT ALLEY. ITS NOW CUT-OFF BY THE DYKE. WATER FLOWED INTO AND OUT OF THE POND VIA THIS CHANNEL AND SOME UPSTREAM CONNECTIONS. FLOW BEGAN WHEN MAINSTEM DISCHARGE SURPASSED 50 CMS MEASURED AT LAKE COWICHAN. THE CHANNEL STILL FLOWS BUT ITS LOST ITS CONNECTION WITH ROTARY PARK POND. IT STILL CONNECTS WITH FISH GUT ALLEY 5M BELOW THE ROTARY PARK POND OUTLET CULVERT. LAKE MAIN STEM FLOWS WERE HIGHER 99 CMS MEASURED AT STATION DOWNTOWN LAKE COWICHAN). UPSTREAM FISH PASSAGE IS QUESTIONABLE DUE TO CULVERT VELOCITIES

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. / Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
8/5/87	30	0	220(0)	0	0	2200
29/2/88	31	0				

FISH UTILIZATION

Chum spawning in years of high return - adequate flow. 276 carcasses were counted in 1988. All eggs were probably lost because the channel was dry most of the incubation period. However, the major function of this channel may have been to provide access to Rotary Park Pond for wintering salmonids - especially COHO 10,519 to 18,989 coho smolts were trapped below the pond in the late 1970's (Argue, et al 1979)

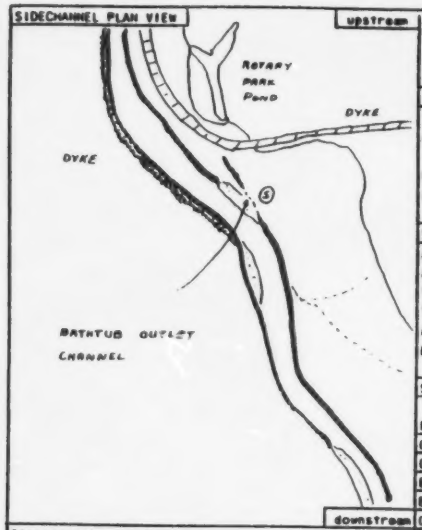
ENHANCEMENT ASSESSMENT

Diversion from Fish Gut Alley would provide permanent wetting. It may be most appropriate to provide winter water only for chum spawning and incubation. Fish Gut alley as better rearing habitat. However this channel may have provided overwintering coho and trout important access to Rotary Park - Fish Gut alley.

Increased wetted area = 2200
Yield potential = 1,100,000 chm. fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: CEWICHAN
Watershed Code:
Sidechannel No.: 16F NTS Map: 92 B/15
Site Location: CENTRAL
87 / 10 / 10 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 394 136, 137
flight line photo nos.
Weather: CLEAR, WARM Air Temp. °C: 20
Access: TRANS AM, MINISTRY Water Temp. °C: 14
RD, BASE, FIRST SPUR RD., PATH

SIDECHANNEL SUMMARY

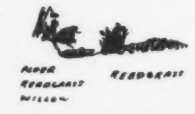
Avg. Chan. Width (m)	5	Total Pool (%)	100
Avg. Wetted Width (m)	2	Total Riffle (%)	
Total Length (m)	60 (27)	Total Run (%)	
Total Wetted Area (m^2)	54	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	5	
Gravel	5	
Cobbles	0	
Boulders	0	
Bedrock	0	

Compaction NIL (L) M H

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

A FLOOD CHANNEL IN TECHNICAL TERMS BUT ALSO WETTED BY THE WINTER WATER TABLE, BACK FLOODING AND LATERAL PERCOLATION THROUGH THE BAR

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 16F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
8/5/87	30	.013	60	5	300	500
29/5/87	19	.00672	45	3	135	
31/7/87		0	30	2	60	
8/8/87	4.48	0	28	2	56	
10/10/87			27	2	54	

FISH UTILIZATION

Coho rearing and wintering. Coho fry that enter in channel become trapped by June. Very number 100 - 200 and must be salvaged. Conductivity difficult because of debris and vegetation overhang

ENHANCEMENT ASSESSMENT

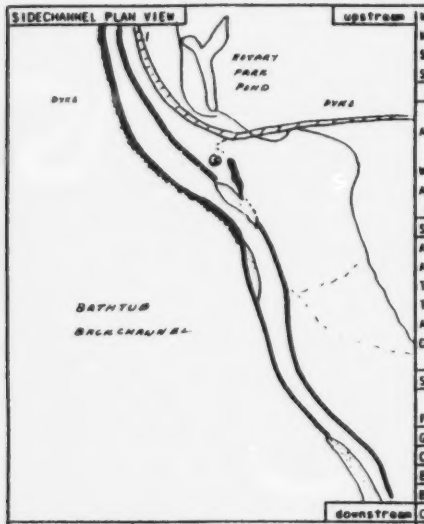
Connecting the Bathtub to Fish Alley would provide permanent flow.

Wetted area increase = 300 m^2

Yield potential = 96 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: CRWICHAN
Watershed Code:
Sidechannel No.: 17B NTS Map: 92 B/12
Site Location: HEAD
87 | 8 | 5 Time: ____ Agency: ____ Crew: TG
yr mo day
Air Photo Location No.: BCC 394 136, 137 (flight line / photo nos.)
Weather: CLEAR, HOT Air Temp. °C: 35
Access: TRANS RD ; MACHINTRY Water Temp. °C: 20
RD, OVHD ; FOOT SKID RD ; PATH

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	5	Total Riffle (%)	
Total Length (m)	100	Total Run (%)	
Total Wetted Area (m^2)	500	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	100
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	F	
Gravel	X	
Cobbles	C	
Boulders	B	
Bedrock	O	

Compaction: NIL L M (H)

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY THE WINTER WATER TABLE AND MAINSTEM BACKFLOODING DURING HIGH FLOWS. POSSIBILITY OF SOME LATERAL INFILTRATION FROM THE RIVER AT HIGH DISCHARGE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 17B Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge 1 (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
8/5/87	30	.013	100	6	600	600
24/5/87	19	.0073	100	6	600	
21/7/87		0	100	6	600	
8/8/87	4.45	0	100	5	500	
10/10/87		0	97	4.5	437	

FISH UTILIZATION

Coho fry rearing and wintering. Fry become trapped when outflow ceases in early summer. Although the channel remains wetted over the summer, it becomes shallow and warm. No coho fry survive this period and salvage is required. Numbers range between 600 and 1200 based on early May densities of 1 - 2 fry / m^2

ENHANCEMENT ASSESSMENT

Excavation of a connector channel to the mainstem or lower fish bell estuary channel would provide replenishment water and ensure survival of coho fry. Very little excavation would be required. This would be far better than salvage because salvage is very difficult in this channel due to the presence of escape cover, algae, debris and sediment.

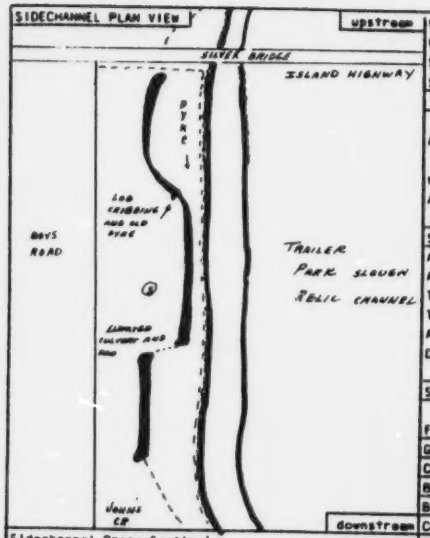
Wetted area increase = 600 m^2

Yield Hab = 19 smolts

1 Outlet channel discharge

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN

Watershed Code:

Sidechannel No.: 18R NTS Map: 92 B/13

Site Location: CENTRAL

Time: ____ Agency: ____ Crew: TB

YR MO DAY: 87 | 9 | 9

Air Photo Location No.: BCC 394 flight line 143, 146 photo nos.

Weather: CLEAR, HOT Air Temp. °C: 35

Access: BOYS RD Water Temp. °C: 23

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	18	Total Pool (%)	
Avg. Wetted Width (m)	15	Total Riffle (%)	
Total Length (m)	900	Total Run (%)	
Total Wetted Area (m^2)	13500	Total Glide (%)	
Ave. Slope (%)	.001	Total Slough (%)	100
Debris (%)	2	Turbidity (cm)	NIL
		Total	100%

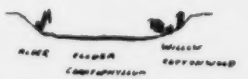
SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Hill (L) M H

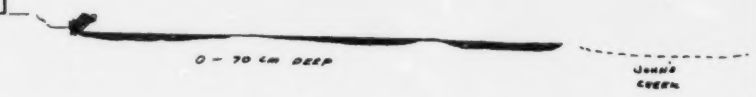
Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)



Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. / Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
2/4/87	44	0	900	18	16200	16200
9/8/87	448	0	900	15	13500	
2/10/86	9	0	900	15	13500	
10/10/87	7	0	900	14	12600	

FISH UTILIZATION

Occasional coho and chum spawning and coho rearing and wintering. Nearly all summer rearing coho are lost to predation or inhospitable conditions (Lunn, 1985)

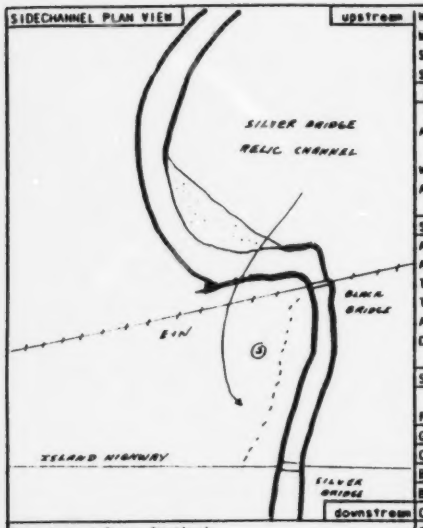
ENHANCEMENT ASSESSMENT

Part of the Lower River South Side Sidechannel Complex which comprises six sidechannels. Addition of summer water at the head of Silver Bridge Relic would add 45932 m^2 to the base wetted area, an increase of 158 %.

This sidechannel would gain 2700 m^2 However this figure is misleading because the present residual wetted area is not habitable due to stagnation. A better estimate is 16,200 which would bring the total to 45932.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: CHEMAINUS
Watershed Code:
Sidechannel No.: 19R NTS Map: 92 B/13
Site Location: 100 M BELOW HEAD
87 / / 26 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 394 139 / 137
flight line photo nos.
Weather: ____ Air Temp. °C: ____
Access: ____ Water Temp. °C: ____

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	14	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	325	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

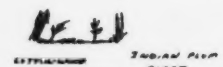
SUBSTRATE COMPOSITION

	%
Fines	4
Gravel	5
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction Nil (D) M H

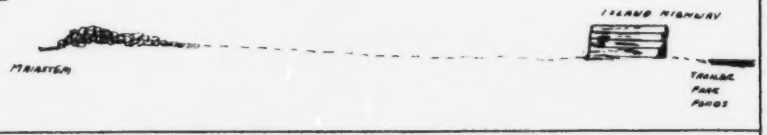
Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)



Comments:

PART OF AN EXTENSIVE SIDECHANNEL SYSTEM THAT WAS CUT-OFF IN THE 1950's BY CONSTRUCTION OF THE PRESENT ISLAND HIGHWAY. SINCE THEN, ITS BEEN FURTHER ISOLATED BY DYKING. THE CHANNEL IS NOW ONLY SPORADICALLY WETTED BY THE WINTER WATER TABLE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 19R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/1/87		0	325(e)	0	0	4550

FISH UTILIZATION

None

ENHANCEMENT ASSESSMENT

introducing water at the channel head would increase downstream wetted area by the following amounts in the Lower Rain South Side Sidechannel Complex

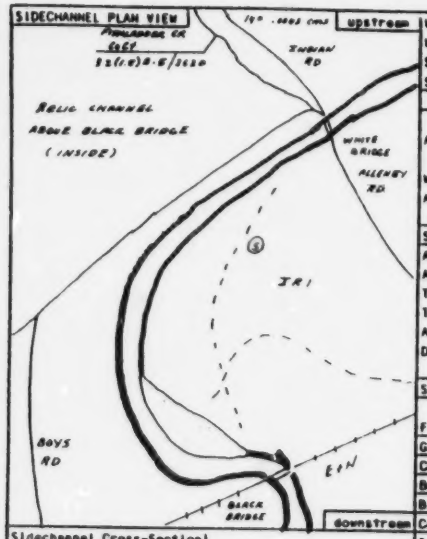
1	Silver Bridge Relic	(19R)	4550 m^2
2	Trailer Park Slough	(18R)	18200
3	Pond Creek	(11A)	7600
4	Mayor Jimmy's	(8)	9693
5	Dyke Road	(SF11A)	8050
6	Duckmead	(SF8A)	3141

TOTAL 459 32 m^2

Yield potential = 14698 CO smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 20R NTS Map: 92 B/13
Site Location: 1300 m BELOW HEAD
87 / 1 / 20 Time: Agency: Crew: T.B
yr mo day
Air Photo Location No.: BCC 394 flight line 138, 139 photo nos.
Weather: Air Temp. °C:
Access: ALLENBY OR INDIAN RDS TO THE RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	14	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	500	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

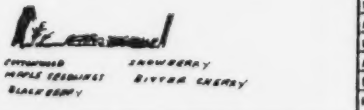
SUBSTRATE COMPOSITION

	%
Fines	4
Gravel	5
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 20R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/1/87		0	500(a)	0	0	7000

FISH UTILIZATION

None

ENHANCEMENT ASSESSMENT

Good potential for a chum spawning channel. Width and length are not limited to present dimensions but have been utilized to calculate yield.

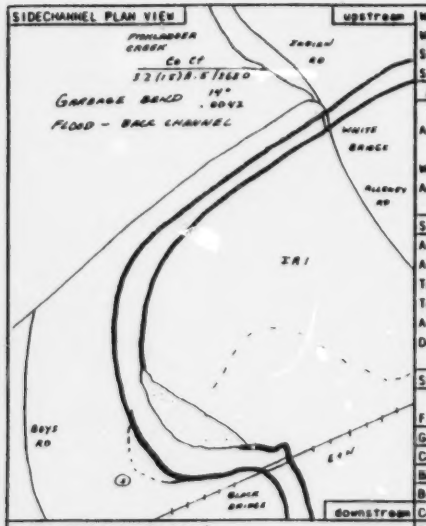
Complete excavation up to the outlet berm is necessary.

Wetted area increase = 7000 m^2

Yield pot = 3,500,000 chum fry
= 2240 Co smolts
= 1120 Ch smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 21F NTS Map: 92 B/13
Site Location: CENTRAL

87 | 10 | 7 Time: Agency: Crew: TB
yr mo day

Air Photo Location No.: N/A flight line photo nos.

Weather: CLEAR, COOL Air Temp. °C: 18
Access: BOYS RD, LOW YARDAT Water Temp. °C: 15

SIDECHANNEL SUMMARY

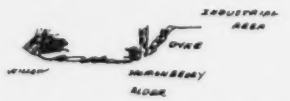
Avg. Chan. Width (m)	5	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	84	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	100
Debris (%)	30	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines		
Gravel		
Cobbles		
Boulders		
Bedrock		

Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments: THIS CHANNEL IS AS MUCH A BACK CHANNEL AS IT IS A FLOODCHANNEL

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 21F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/4/87	40	0	40	5	200	420
5/5/87	30	0	40	5	200	
1/6/87	19	0	35	5	175	
9/8/87	998	0	26	5	130	
8/10/87		0	28	5	140	

FISH UTILIZATION

Chance of coho overwintering in backchannel portion a few coho also summer rear in this segment

ENHANCEMENT ASSESSMENT

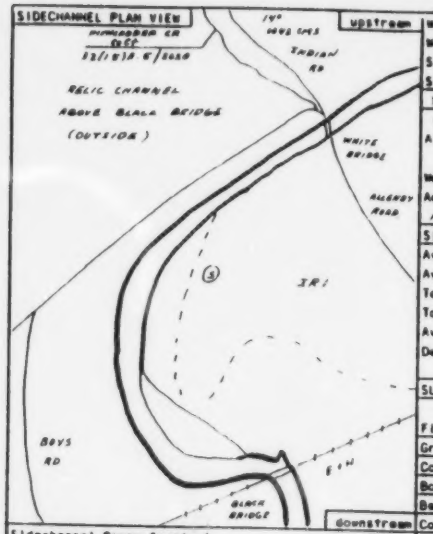
A buried drain could be installed below the weir berm to provide year round flow

Wetted area increase = 290 M^2

Pool pot = 42 cm smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: CONICHAN

Watershed Code:

Sidechannel No.: 22R NTS Map: 92 B/13

Site Location:

97 / 1 / 20 Time: Agency: Crew: TB

yr mo day

Air Photo Location No.: BCC 394 flight line 138, 139 photo nos.

Weather: Air Temp. °C:

Access: ALLEWAY OR TRAIL Water Temp. °C:

ROAD TO IRI ROAD

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	320	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

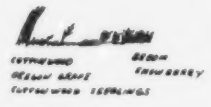
SUBSTRATE COMPOSITION

	%
Fines	4
Gravel	5
Cobbles	1
Boulders	0
Bedrock	

Comments:

Compaction Nil (L) M H

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 22R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/1/97		0	320(a)	0	0	2560

FISH UTILIZATION

None

ENHANCEMENT ASSESSMENT

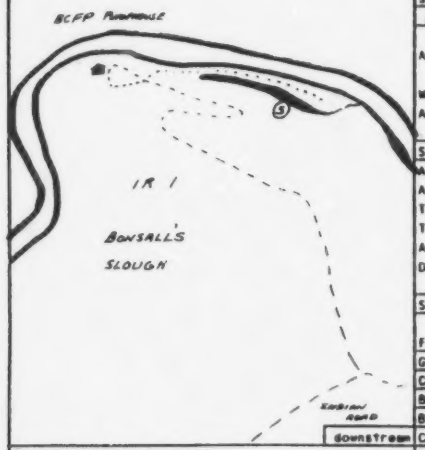
Good potential for a chum spawning channel length and width are not limited to channel dimensions. The flood plain lobe here is approximately 75 metres and offers enough only that area as potential chum spawning area. Complete excavation of the old berm is required.

Wetted area increase = 2560 m^2

Yield pot. = 1,280,000 cm, 256.0, 409 ch

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW — upstream



downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 23B NTS Map: 92 B/13
Site Location: CENTRAL
17 | 5 | 24 (yr mo day) Time: ____ Agency: ____ Crew: TB
Air Photo Location No.: BCC 394 (flight line) 139, 140 (photo nos.)
Weather: CLEAR Air Temp. °C: 22
Access: INDIAN ROAD, TIDA ROAD Water Temp. °C: 15

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	
Avg. Wetted Width (m)	14	Total Riffle (%)	
Total Length (m)	200	Total Run (%)	
Total Wetted Area (m^2)	2800	Total Glide (%)	
Ave. Slope (%)	.0001	Total Slough (%)	100
Debris (%)	2	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	4
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Hill L (M) H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE AND PERCOLATION THROUGH THE BAR

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 23B

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/5/87	30	.006	200+77	15+1	3000+77	4155
24/3/87	19	0	200	14	2800	

FISH UTILIZATION

Chum spawning, coho wintering

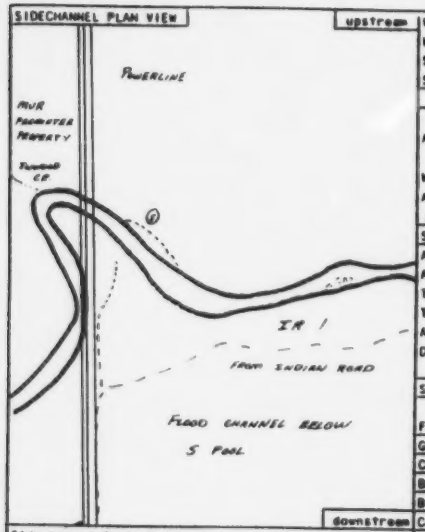
ENHANCEMENT ASSESSMENT

Scarification and inlet maintenance required periodically if enough flow could be provided to flush the channel. 4155 m^2 of chum spawning habitat would result if some percolated through the summer. Use could be coho only. Most leave the channel as fry.

Yield Pot = 2,077.500 cm Fry
= 519 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 24F NTS Map: 92 B/13
Site Location: NEAR INLET
87 | 5 | 16 Time: Agency: Crew: TB
YY mo day
Air Photo Location No.: BCC 394 flight line 141 photo nos.
Weather: Air Temp. °C:
Access: ROUGH ROAD FROM INDIAN ROAD, WARE RIVER Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	135	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	7
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 24F

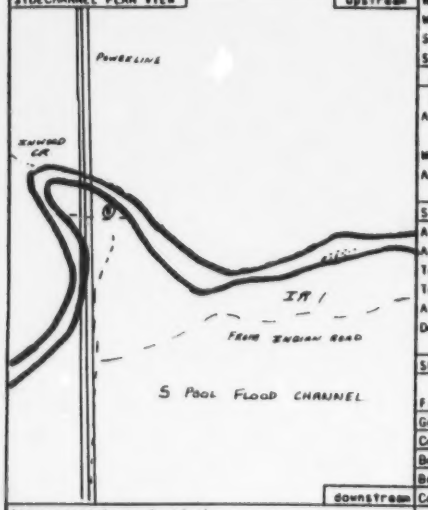
Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/5/87	30	0	135	0	0	810

FISH UTILIZATION: none

ENHANCEMENT ASSESSMENT: no enhancement potential

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW — upstream



downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 25F NTS Map: 92 B/9
Site Location:
87 | 9 | 9 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 394 (flight line) 141 (photo nos.)
Weather: CLEAR, HOT Air Temp. °C: 34
Access: ROUGH ROAD FROM INDIAN ROAD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	113	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	8
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction NIL (U) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 25F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/3/87	30	0	113	0	0	904
1/8/87	9.48	0	113	0	0	

FISH UTILIZATION

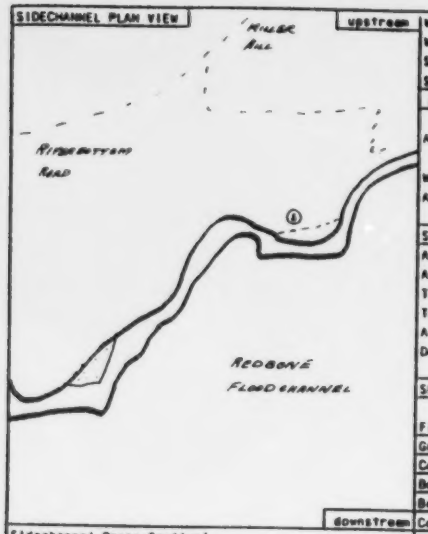
Possibility of chum spawning

ENHANCEMENT ASSESSMENT

No opportunities for improvement are present

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: CONICHAN
Watershed Code:
Sidechannel No.: 26F NTS Map: 92B/13
Site Location: NEAR INLET
87 / 5 / 16 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 464 flight line 636, 637 photo nos.
Weather: Air Temp. °C:
Access: RIVERBOTTOM RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	3	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	98	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	15	Total Slough (%)	
Debris (%)	15	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	7
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction NIL (1) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 26F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/5/87	30	0	98	0	0	294

FISH UTILIZATION

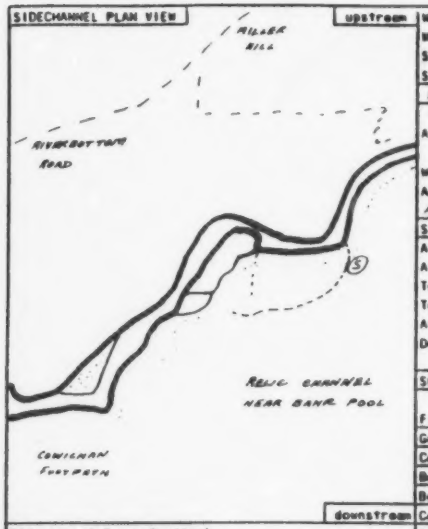
a few coho fry enter the channel in april

ENHANCEMENT ASSESSMENT

installation of a drain under the berm could provide permanent flow.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 27R NTS Map: 92 B/13
Site Location:
77 | 8 | 8 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 034 / 037
flight line photo nos.
Weather: CLEAR, HOT Air Temp. °C: 34
Access: WADE RIVER OR HIKE Water Temp. °C:
FOOTPATH FROM HOLT CREEK

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	4	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	320	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	0
Gravel	0
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

THIS CHANNEL MAY NOT DRY EVERY YEAR

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 27R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
22/1/87		.02	320	1	320	1600
16/5/87	30	.0075	320	1	320	
24/6/87	19	.006	101	.8	81	
8/8/87	4.48	0	0	0	0	
8/10/87		0	0	0	0	

FISH UTILIZATION

Coho wintering and spring rearing

ENHANCEMENT ASSESSMENT

It may be possible to link this channel with Bear Pool Relic Channel

Wetted area increase = 1600 M^2

Yield potential = 512 Coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 29A NTS Map: 92 B/13
Site Location: CENTRAL
87 | 9 | 9 Time: ____ Agency: ____ Crew: TA
yr mo day
Air Photo Location No.: BCC 484 036, 037
flight line photo nos.
Weather: CLEAR, HOT Air Temp. °C: 32
Access: COWICHAN FOOTPATH Water Temp. °C: 17-21.5
FROM HOLT CR. OR WADE RIVER

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	16	Total Pool (%)	54
Avg. Wetted Width (m)	4	Total Riffle (%)	32
Total Length (m)	370	Total Run (%)	
Total Wetted Area (m^2)	1480	Total Glide (%)	14
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	2	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	7
Cobbles	1
Boulders	1
Bedrock	0

Comments:

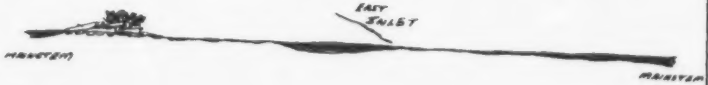
downstream
Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	4
Wetted Width (m)	3.7
Avg. Depth (cm)	.13
Wetted X-Sec Area (m^2)	.471
Avg. Velocity (m/sec)	.207
Flow (m^3/sec)	.0797 (2.81 cfs)
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)



Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 29A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimun
16/5/87	30	3.22	370	17	6290	6660
24/5/87	19	.64	370	7	2590	
31/7/87		.167	370	5	1850	
8/9/87	4.49	.079	370	4	1480	
8/10/87		.165	370	5	1850	

FISH UTILIZATION

Coho, steelhead and chum spawning.
Coho summer rearing.

ENHANCEMENT ASSESSMENT

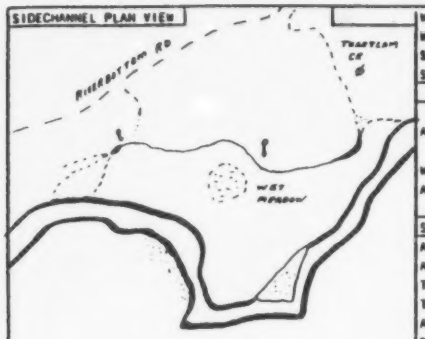
Buried drains under the inlet berms could provide more summer flow

Wetted area increase = 5180 m^2
Yield potential = 1657 Coho smolts

Excavation of overwintering pools would be much cheaper and accomplish the same result

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 29A NTS Map: 92 B/13
Site Location: NEAR UPPER END
17 | 7 | 96 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 94Y flight line 037, 038 photo nos.
Weather: CLEAR ; WARM Air Temp. °C: 29
Access: RIVERBOTTOM RD, ROAD THEN PATH Water Temp. °C: 12

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	76
Avg. Wetted Width (m)	2	Total Riffle (%)	24
Total Length (m)	500	Total Run (%)	
Total Wetted Area (m^2)	1000	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	7
Cobbles	1
Boulders	0
Bedrock	0

Comments:

downstream Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	1.8
Wetted Width (m)	1.3
Avg. Depth (cm)	.05
Wetted X-Sec Area (m^2)	.065
Avg. Velocity (m/sec)	.31
Flow (m^3/sec)	.0164 (.567 cfs)
Mainstem Discharge (m^3/sec)	9

Gradient Profile: Longitudinal)

Comments:

WETTED BY
1 WINTER WATER TABLE
2 SEEPAGE FROM UPLAND
3 OCCASIONAL LIGHT SPILL FROM MAINSTEM
4 TZARTLAM CR (NOV - MAY ; LOWER 1 cm)

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 29A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
17/7/96	9	.01	500	2	1000	3400
20/4/97	40	.035	680	5	3400	
18/5/97	30	.03	680	5	3400	
28/5/97	20	.021	500	4	2000	
4/8/97	7	.0104	500	2	1000	
8/8/97	448	.0168	500	2	1000	
01/12/96	55	.02	680	5	3400	

FISH UTILIZATION

Coho and chum spawning ; coho summer rearing and overwintering

Tzartlam Channel produced 1.04 coho smolts per square meter in 1976 (Pague et al, 1979). They called it "Cowichan Sidechannel"

a few cutthroat trout and lampreys are also present.

Fry densities (m^2) From Holtby (pers comm)

16/9/96 Co 2.5 Ct 1.0

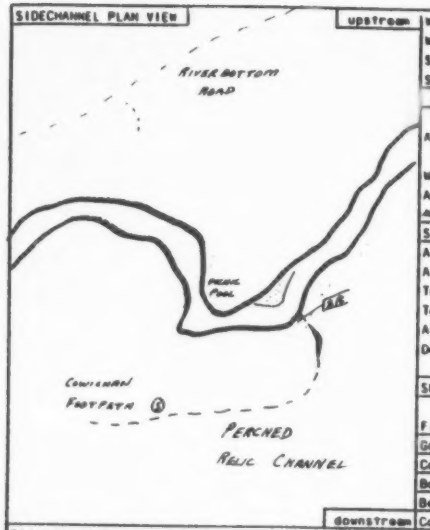
12/10/96 Co .125 Ct .13

ENHANCEMENT ASSESSMENT

No improvement necessary

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No. 30R NTS Map: 92 B/13
Site Location: 100 M BELOW CHANNEL ROAD
87 | 7 | 8 Time: Agency: Crew: TB
yr mo day
Air Photo Location No. BCC 409 036, 037
flight line photo nos.
Weather: CLEAR, HOT Air Temp. °C: 23
Access: COWICHAN FOOTPATH FROM Water Temp. °C:
WATER IS WHERE OR JUST RIVER IN PICNIC POOL AREA

SIDECHANNEL SUMMARY

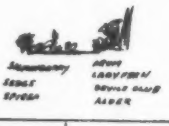
Avg. Chan. Width (m)	10	Total Pool (%)	100
Avg. Wetted Width (m)	.009	Total Riffle (%)	
Total Length (m)	550	Total Run (%)	
Total Wetted Area (m^2)	50	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	9	
Gravel	2	
Cobbles	1	
Boulders	8	
Bedrock	0	

Compaction Nil L M H

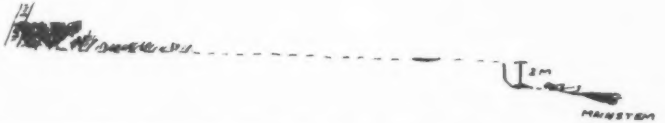
Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)



Comments:

NO CONNECTION WITH RIVER, INNACESSIBLE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 30R

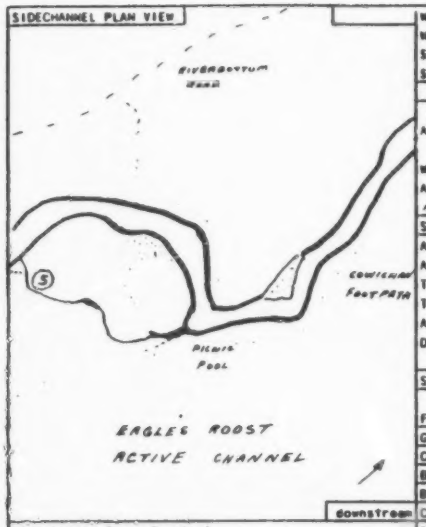
Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/5/87	30	.00045	550	1	550	55 00
24/5/87	19	0004	550	1	550	
31/7/87		0	550	2	110	
8/8/87		0	10	009	50	
8/10/87		0	10	.009	60	

FISH UTILIZATION: none

ENHANCEMENT ASSESSMENT: no opportunities exist.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 31A NTS Map: 92 B/13
Site Location: NEAR INLET
87 | 8 | 7 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 464 flight line: 087, 088 photo nos.
Weather: CLEAR, HOT Air Temp, °C: 32
Access: RIVERBOTTOM RD, ROAD AND PATH TO TRAILHEAD AND PICNIC POOL OR COWICHAN Water Temp, °C: 17.5

SIDECHANNEL SUMMARY

			Footpath
Avg. Chan. Width (m)	12	Total Pool (%)	39
Avg. Wetted Width (m)	7	Total Riffle (%)	17
Total Length (m)	400	Total Run (%)	
Total Wetted Area (m^2)	3800	Total Glide (%)	14
Ave. Slope (%)	.5	Total Slough (%)	30
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	9
Cobbles	1
Boulders	1
Bedrock	0

Comments:

Compaction Hi (1) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	7
Wetted Width (m)	4.4
Avg. Depth (cm)	.16
Wetted X-Sec Area (m^2)	.704
Avg. Velocity (m/sec)	5
Flow (m^3/sec)	.282 (9.9 cfs)
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 31A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/5/87	30	.56	400	10	4000	4800
24/5/87	19	36	400	9	3600	
3/7/87		.29	400	7	2800	
9/8/87	4.48	.282	400	7	2800	

FISH UTILIZATION

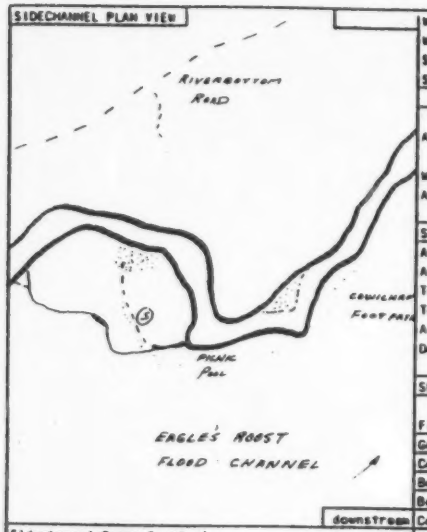
Coho and chum spawning, coho spring - summer rearing and overwintering. Cutthroat trout also spawn and rear in this channel

ENHANCEMENT ASSESSMENT

No improvement required.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 32F NTS Map: 92B/13
Site Location: 50 m ABOVE OUTLET
97 / 5 / 16 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC404 Flight line: 037, 038 photo nos.
Weather: WARM, DRY Air Temp, °C: 20
Access: COWICHAN FOOTPATH FROM HOLT CREEK Water Temp, °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	160	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

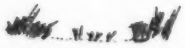
SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream Compaction Nil (L) M H

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 32F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
22/1/97		0	0	0	0	1230
16/3/97	30	0	0	0	0	

FISH UTILIZATION

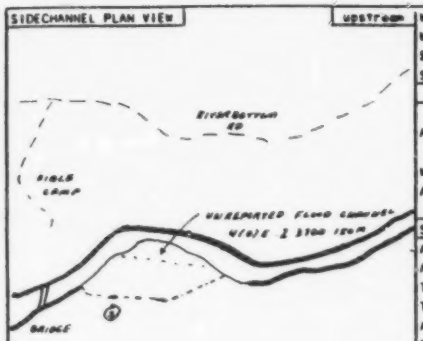
None at this flood channel only flowing in floods may go several years without carrying water

ENHANCEMENT ASSESSMENT

Not suitable for enhancement

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 33A NTS Map: 92 G/13
Site Location:
87 | 8 | 9 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 909 flight line 039, 039 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 33
Access: RIVERBOTTOM RD, Water Temp. °C: 13 - 17
BIBLE CAMP TOS. BRIDGE, PATH

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	100
Avg. Wetted Width (m)	3	Total Riffle (%)	
Total Length (m)	270	Total Run (%)	
Total Wetted Area (m^2)	437	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

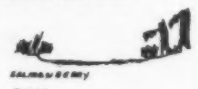
SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	7
Cobbles	1
Boulders	0
Bedrock	0

Comments:

downstream: Compaction Nil (L) M H

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal

Comments:

WETTED BY
1 MAINSTEM SPILL (NOV - APRIL)
2 WINTER WATER TABLE
3 GROUNDWATER UPWELLING

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 33A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/4/87	40	.47	270	9	2430	2700
19/5/87	30	.612	270	6	1620	
25/6/87	28	0	162	4	648	
9/8/87	9.45	0	112	3	937	

FISH UTILIZATION

coho, spring/sum and chum spawning, coho and steelhead rearing

Fry salvage required. Usual yield: 500 - 1000 coho

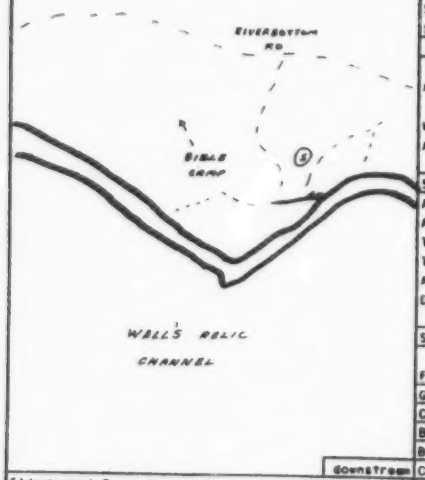
ENHANCEMENT ASSESSMENT

Installation of a buried drain underneath the water berm could provide perennial flow. The berm should also be lowered and more cover added to the channel.

Wetted area increase = 2052 m^2
Yield pot = 656 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Mainstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 34R NTS Map: 92 B/13
Site Location:
87 / 1 / 21 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 087, 089
Flight line photo nos.
Weather: Air Temp. °C:
Access: Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	20	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	270	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.001	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	1
Cobbles	2
Boulders	0
Bedrock	0

Comments:

Downstream

Compaction NIL L M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal

Comments:

AN OVERMATURE CHANNEL LONG REMOVED FROM RIVER INFLUENCE A FEW PUDDLES SURFACE DURING HIGH RIVER FLOWS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 34R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
21/1/87		0	270(0)	0	0	5400

FISH UTILIZATION

None

ENHANCEMENT ASSESSMENT

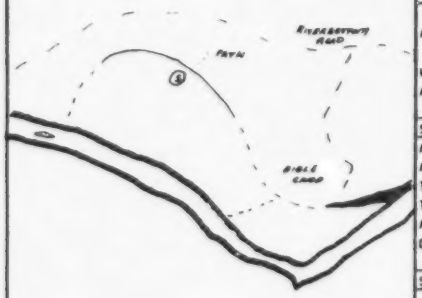
This channel could be linked with the Bible Camp Backchannel to provide additional winter habitat for coho. Minor ex. watch and a small culvert (3 m) would allow backflooding.

Wetted area increase = 5400 m^2

Yield pot = 5400 cu smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



downstream

Watershed Name: COWICHAN

Watershed Code:

Sidechannel No.: 35A NTS Map: 92 B/13

Site Location: CENTRAL

yr 87 | mo 9 | day 9 Time: ____ Agency: ____ Crew: TB

Air Photo Location No.: BC 4004 flight line 039, 040 photo nos.

Weather: CLEAR, WARM Air Temp. °C: 33

Access: RIVERBOTTOM RD, BIBLE CAMP Water Temp. °C: 14

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	50 (4)	Total Pool (%)	80
Avg. Wetted Width (m)	2	Total Riffle (%)	15
Total Length (m)	730 (5m)	Total Run (%)	
Total Wetted Area (m^2)	660	Total Glide (%)	5
Ave. Slope (%)	.001	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	n/a
		Total	100%

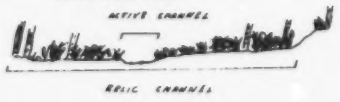
SUBSTRATE COMPOSITION

	%
Fines	77
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction NIL L (M) H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	9
Wetted Width (m)	8
Avg. Depth (cm)	.035
Wetted X-Sec Area (m^2)	.028
Avg. Velocity (m/sec)	.06
Flow (m^3/sec)	.001613 (.058 CFS)
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile: Longitudinal)

Comments:

AN ACTIVE CHANNEL WITHIN A RELIC CHANNEL. AVERAGE ACTIVE CHANNEL WIDTH IS 4 M

AUGUST 6 - 11 DRAWDOWN CAUSED THE LOSS OF 740 m^2 OF WETTED AREA

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 35A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
19/5/86	49	.028	730	4	2920	2920
18/8/87	30	.018	730	3	2190	
25/5/87	20	.008	650	2	1300	
4/8/87	7	.0051	650	2	1300	
9/9/87	4.48	.0015	380	1.96	560	
16/9/86	6.9	.008	390	4	1560	
12/7/86	70	.012	730	4	2920	

FISH UTILIZATION

Coho spawning, overwintering and summer rearing. This channel produced 2870 coho smolts in 1986 (Argue et al., 1989). .98 /m^2

Fry densities (m^2) From Halfday (pers. comm.)

16/9/86 Co 4.0 Cf .096

12/7/86 Co 26.0 Cf .19

ENHANCEMENT ASSESSMENT

The entire channel could be excavated for chum spawning resulting in 36,500 m^2. However, the channel is not suited for coho production. Installation of a drain beneath the outlet berm might provide permanent flow.

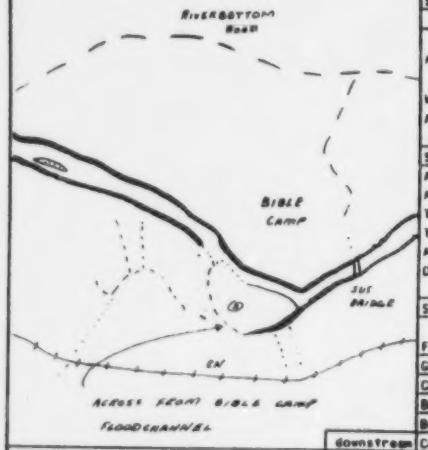
Wetted area increase = 2360 m^2

Yield pot. = 755 additional Co smolts

Excavation of an adjacent pond may also be required

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 36F NTS Map: 92 B/13
Site Location: CENTRAL
87 | 8 | 8 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 904 flight line 039, 040 photo nos.
Weather: CLEAR, HOT Air Temp, °C: 34
Access: RIVERBOTTOM RD. Water Temp, °C: 28
BIBLE CAMP BRIDGE

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	40	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	150	Total Run (%)	
Total Wetted Area (m^2)	50	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	100
Debris (%)	/	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	1
Fines	5
Gravel	3
Cobbles	2
Boulders	1
Bedrock	Tr

Comments:

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE AND SPILL ALSO BY A TRIBUTARY CHANNEL AND UPLAND RUN-OFF AND SEEPAGE LOWER 100 m BACKFLOODS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 36F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length ±50 (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
30/4/87	40	0	150	5	950	14 000
19/5/87	30	0	100	3	300	
13/5/87	20	0	80	2	160	
3/8/87	9.48	0	50	1	50	

FISH UTILIZATION

Chum spawning; coho spring - summer rearing in backwater segment. Fry salvage required usual yield 500 - 1,000 em

ENHANCEMENT ASSESSMENT

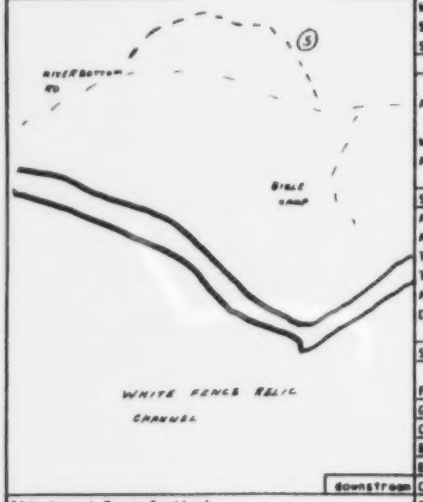
Not suitable for improvement due to instability however, if other dispersal measures were incorporated, this channel could yield important numbers

Wetted area increase = 1500 m^2
Yield potential = 4320 CO smolts
2 160 CH smolts
= 4,320,000 emi fry I

I This equals the number of eggs because chum spawn naturally in this channel however, in most years, only about half these eggs survive to the fry stage. In 1986, very few chinook, shown were seen high enough in one year (1983) to assist food recovery.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 37A NTS Map: 92 B/13
Site Location: CENTRAL
37 / / 22 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 (flight line) 059, 060 (photo nos.)
Weather: ____ Air Temp. °C: ____
Access: RIVER BOTTOM ROAD Water Temp. °C: ____

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	415	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	01	Total Slough (%)	
Debris (%)	30	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments:

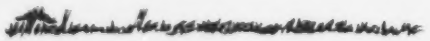
Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)



Comments:

AN OLD POST GLACIAL CHANNEL FAR REMOVED FROM RIVER INFLUENCE IN TIME AND SPACE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 37A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
22/1/87		0	415	0	0	2490

FISH UTILIZATION

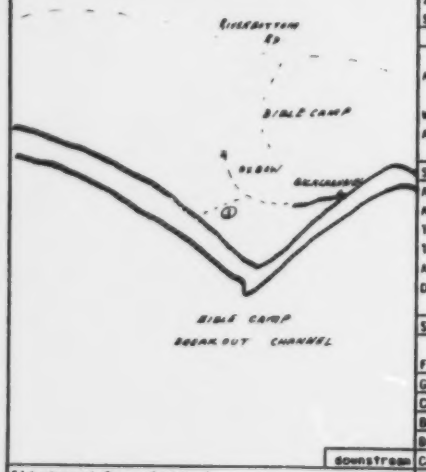
None

ENHANCEMENT ASSESSMENT

Beyond the range of river influence and enhancement

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 39F NTS Map: 92 B/13
Site Location: CENTRAL
87 / 1 / 21 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 414 flight line 039, 040 photo nos.
Weather: Air Temp. °C:
Access: RIVERBOTTOM RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	100	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

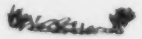
SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	6
Cobbles	1
Boulders	1
Bedrock	0

Comments:

downstream Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 39F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
21/1/87		0	100	0	0	600

FISH UTILIZATION

None

ENHANCEMENT ASSESSMENT

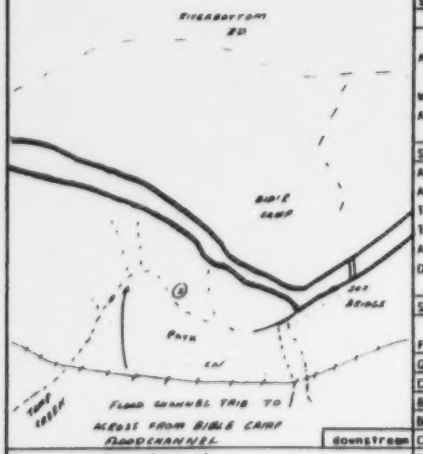
Installation of a buried drain in the sump could provide permanent wetting

Wetted area increase = 600 m^2

Yield pot = 192 to 300 #'s

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 39F NTS Map: 92 B/13
Site Location
8 | 8 | 07 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 flight line: 039, 040 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 34
Access: RIVERBOTTOM RD, WALK Water Temp. °C:
CAMP

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	2	Total Riffle (%)	
Total Length (m)	360	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total:	100%

SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	4
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction NIL (1) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY A TEMPORARY STREAM, THE WINTER WATER TABLE, GROUNDWATER SEEPAGE FROM THE UPLAND AND OCCASIONAL SPILL FROM THE MAINSTEM

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 39F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length 360 (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
10/4/87	40	0	28	5.2	120	2160
19/5/87	80	0	12	3	60	
8/8/87	448	0	0	0	0	

FISH UTILIZATION

Coho and chum spawning, coho and chinook spring rearing and coho wintering

Fry salvage required. Usual yield: 500 CO, 50 CA, 1000 CM

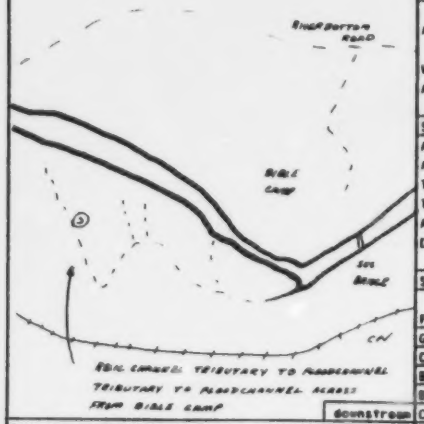
ENHANCEMENT ASSESSMENT

Excavation of a deep pool near the head of the breakout channels and a buried drain might provide permanent flow

Wetted area maximum = 2160 m^2
Yield potential: 648 CO SMOLTS
345 CA SMOLTS

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN

Watershed Code:

Sidechannel No.: 40R NTS Map: 92 B/3

Site Location: CENTRAL

97 | 4 | 20 Time: Agency: Crew: TB
yr mo day

Air Photo Location No.: BCC 409 flight line 039, 040 photo nos.

Weather: Air Temp. °C:

Access: Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	250	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	1
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M(H)

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

A VERY MATURE CHANNEL THAT HASN'T CARRIED FLOW FOR MANY YEARS. A FEW PUDDLES ARE PRESENT IN MID-WINTER WHEN THE WATER TABLE IS HIGH

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 40R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/4/97	40	0	250	0	0	1250

FISH UTILIZATION

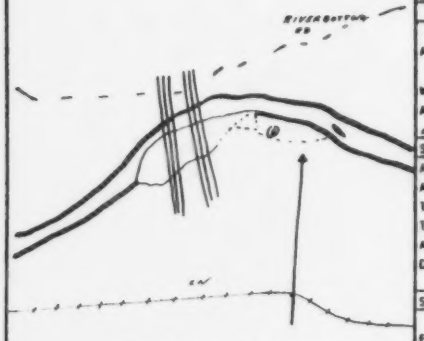
None

ENHANCEMENT ASSESSMENT

Not subject to improvement without very high cost

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW — upstream



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 41F NTS Map: 92 B/13
Site Location: 60m BELOW INLET
17 / 9 / 97 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 96V flight line: 039,040 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 34
Access: RIVERBOTTOM RD WADE Water Temp. °C: 17
OR BOAT RIDGE AT POWERLINE OR HIKE FROM RIDGE CAMP

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	4	Total Pool (%)	100
Avg. Wetted Width (m)	.32	Total Riffle (%)	
Total Length (m)	65	Total Run (%)	
Total Wetted Area (m^2)	21	Total Glide (%)	
Ave. Slope (%)	.8	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	4
Cobbles	2
Boulders	1
Bedrock	0

Comments:

downstream — Compaction NIL L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

WETTED BY THE WINTER WATER TABLE AND RIVER FLOWS ABOVE 16 CMS. BECOMES INT WHEN THE MAINSTEM DROPS BELOW 16 CMS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 41F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/4/97	44	.64	200	4	880	100
18/5/97	30	.086	200	1.7	340	
25/5/97	20	.007	200	1	200	
9/9/97	4.45	0 (INT)	65	.32	21	

FISH UTILIZATION

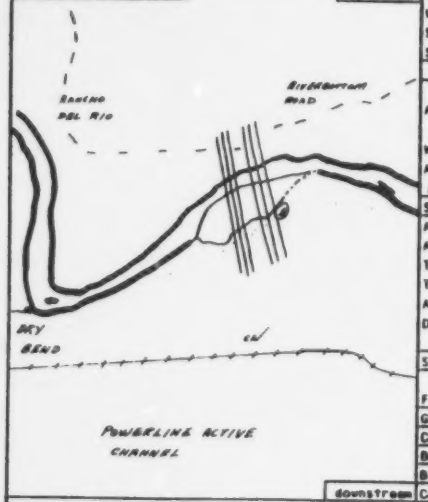
Coho spring - early summer rearing.

ENHANCEMENT ASSESSMENT

Possible to provide permanant
rearing by excavating an infill pool and
[illegible]
Wetted area increase = 108 m²
Build out = 248 sq meters

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 42A NTS Map: 92 B/13
Site Location: 80 m ABOVE OUTLET
87 / 9 / 9 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 484 038 / 140
flight line photo nos.
Weather: CLEAR, HOT Air Temp. °C: 34
Access: RIVERBOTTOM RD. Water Temp. °C: 21
WADE RIVER OR HIKE FROM GIBLE CAMP

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	14	Total Pool (%)	59
Avg. Wetted Width (m)	3	Total Riffle (%)	14
Total Length (m)	200	Total Run (%)	
Total Wetted Area (m^2)	600	Total Glide (%)	27
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	.5	Turbidity (cm)	N/A
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	6
Cobbles	2
Boulders	1
Bedrock	0

Comments:

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.7
Wetted Width (m)	.7
Avg. Depth (cm)	.04
Wetted X-Sec Area (m^2)	.028
Avg. Velocity (m/sec)	.07
Flow (m^3/sec)	.00174 (.06 CFS)
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile:
Longitudinal)

Comments:

THIS CHANNEL IS IN CLOSE PHASE WITH MAINSTEM DISCHARGE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 42A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
18/5/87	30	.6	250	5	1250	3500
4/8/87	7	.016	250	4	1000	
9/8/87	4.48	.00174	200	3	600	
15/9/87	20	.35	250	5	1250	

FISH UTILIZATION

Coho and chum spawning; coho spring - summer rearing. Some coho likely smolts in this channel but its capability is not high due to high peakal flows and lack of groundwater input.

Many coho fry were lost to drying and predation when the river was lowered to 4.48 cms.

ENHANCEMENT ASSESSMENT

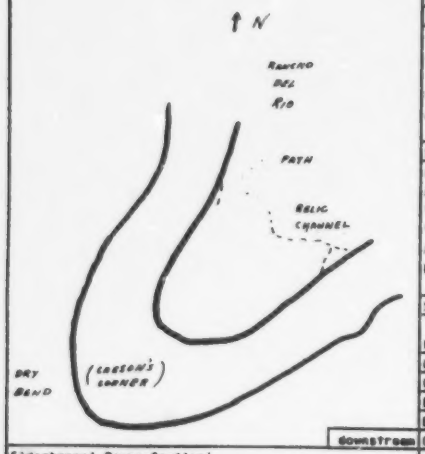
It might be possible to strengthen the outlet weir to buffer high flows and install a drain beneath it to enhance low flows

Wetted area increase = 2700 m^2

Would not 423 CO SMOLTS

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 43R NTS Map: 92B/13
Site Location: RELIC CHANNEL NEAR DRY BEND
87 | 6 | 17 (yr mo day) Time: ____ Agency: ____ Crew: TB
Air Photo Location No.: BCC404 039, 040 (flight line, photo nos.)
Weather: CLEAR Air Temp. °C: 19
Access: RIVERBOTTOM RD Water Temp. °C: NA
PRIVATE RD NEAR POWERLINE XING

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	70	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.001	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

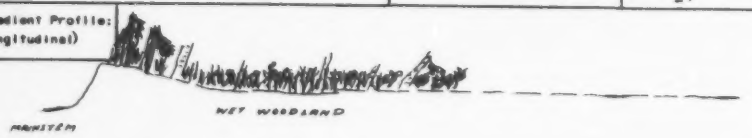
Compaction Nil L M (H)

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	21

Gradient Profile: Longitudinal)



Comments:

WETTED BY WINTER WATER TABLE AND
BACKFLOODING FROM THE MAINSTEM
POSSIBILITY OF SOME COHO WINTERING

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 43R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
15/5/87	30	0	70	.14	50	350
17/6/87	21	0	0	0	0	

FISH UTILIZATION

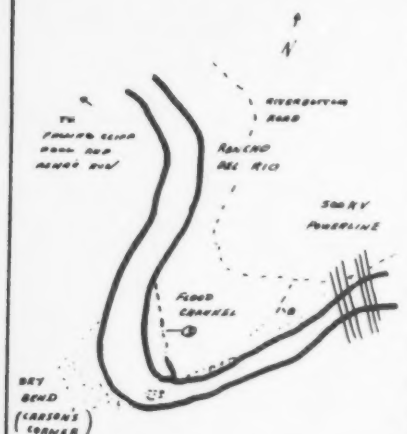
Possibility of coho wintering

ENHANCEMENT ASSESSMENT

Could be excavated to rear/overwintering but little benefit would result

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Sidechannel Cross-Section (downstream view)

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 44F NTS Map: 92B/13
Site Location: FLOOD CHANNEL OPPOSITE DRY BEND
17 | 6 | 17 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BC 404 flight line 039, 040 photo nos.
Weather: CLEAR Air Temp. °C: 18
Access: RIVERBOTTOM RD Water Temp. °C: 15

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	25
Avg. Wetted Width (m)	13	Total Riffle (%)	25
Total Length (m)	120	Total Run (%)	
Total Wetted Area (m^2)	500	Total Glide (%)	
Ave. Slope (%)	2.0	Total Slough (%)	50
Debris (%)	2	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	5
Cobbles	2
Boulders	2
Bedrock	0

Comments:

downstream

Compaction Nil (1) M H

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	/
Wetted Width (m)	/
Avg. Depth (m)	.06
Wetted X-Sec Area (m^2)	.06
Avg. Velocity (m/sec)	.125
Flow (m^3/sec)	.006 (.21 CFS)
Mainstem Discharge (m^3/sec)	21

Gradient Profile: Longitudinal

Comments:

LOWER 90 M FLOWING SLIGHTLY (.006 CMS)
ONE 30 m^2 POOL AT 40 M, CONTAINED ~
50 COHO FRY
CHANNEL INUNDATED BY FLOOD FLOWS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 44F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
29/5/86	53	.06	70	43	650	1500
17/6/87	21	.006	60	3.3	500	
19/9/87		.029 [1]	50	23	345	
8/9/87	448	.013	50	23	345	

FISH UTILIZATION

Coho fry utilize the approximate lower half of the channel from emergence to autumn. Overwintering is doubtful due to probable high turbulence and lack of groundwater. The possibility should not be discarded however, especially in the backwater section.

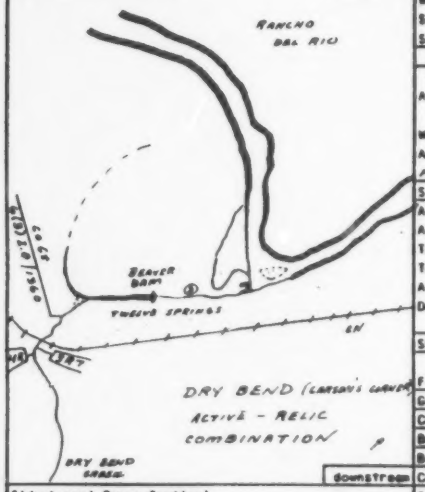
ENHANCEMENT ASSESSMENT

No improvement necessary or possible! The berm could be lowered but this would allow the full force of flood flows and it would soon rebuild. Installing a pipe beneath the berm is impractical due to the unstable nature of the berm.

1 Higher flow due to exposure of a groundwater upwelling area previously unmeasurable

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 45A NTS Map: 92 B/13
Site Location: NEAR BEAVER DAM
97 | 8 | 4 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 040, 041
flight line photo nos.
Weather: CLEAR, WARM Air Temp. °C: 30
Access: WORK RIVER OR HIKE Water Temp. °C: 13
FOOTPATH FROM BIBLE CAMP

SIDECHANNEL SUMMARY

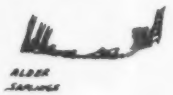
Avg. Chan. Width (m)	18	Total Pool (%)	100
Avg. Wetted Width (m)	9	Total Riffle (%)	
Total Length (m)	900	Total Run (%)	
Total Wetted Area (m^2)	8200	Total Glide (%)	
Ave. Slope (%)	.001	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	6	
Gravel	4	
Cobbles	1	
Boulders	0	
Bedrock	0	

downstream Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)

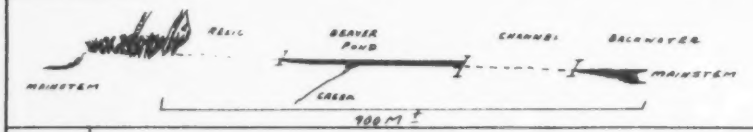


Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal

WA 0-7 7000 ± 0-210 1200 - 1600



Comments:

FOUR REACHES

1 20(20) 0 7200 60-80M - BACKWATER
2 7(0) .01 4600 70M - CHANNEL BELOW BEAVER DAM
3 20(16) 0 8200 350 - BEAVER POND
4 20(0) .01 7200 400 - RELIC

DRY BEND CREEK, THE WINTER WATER TABLE AND BACKFLOODING PROVIDE WETTING THE CREEK IS PERMANENT BUT THE CHANNEL DRIES BELOW THE DAM STREAMFLOW IS CAPTURED BY GRAVEL UNDERLYING THE POND

SIDE CHANNEL ASSESSMENT SUMMARY 1

Sidechannel No. 45A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3) SC	Sidechannel Discharge (m^3) CR	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
19/5/87	30	.022 (.08)		70	2	140	490
26/5/87	19	.019 (.05)			1	70	
4/8/87	7	0 (.015)			0	0	

FISH UTILIZATION

Coho salmon spawning, summer rearing and overwintering. Spawning occurs on the creekmouth fan

ENHANCEMENT ASSESSMENT

Excavation and a buried drain would provide permanent wetting to the relic portion and, quite likely to the reach below the beaver dam.

1 Applies to the reach below the beaver dam which, aside from the creek, is the only measurable portion of the complex. The beaver pond reach has a permanent wetted area of 7000 m^2 ±. The back channel reach wetted area ranges from 1200 - 1600 m^2

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

Watershed Name: COWICHAN/
Watershed Code:
Sidechannel No.: 46F NTS Map: 92B/13
Site Location: LOWER END
87 | 5 | 19 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 040, 041 photo nos.
Weather: CLOUDY, COOL, SHOWERS Air Temp. °C: 15
Access: WARE RIVER OR Water Temp. °C:
HIKE FOOTPATH FROM BIKE CAMP

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	200	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	4
Cobbles	0
Boulders	0
Bedrock	

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal

Comments:

ONLY WETTED IN FLOODS MAY NOT FLOW FOR SEVERAL YEARS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 46F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
18/5/87	30	0	200	0	0	1200

FISH UTILIZATION

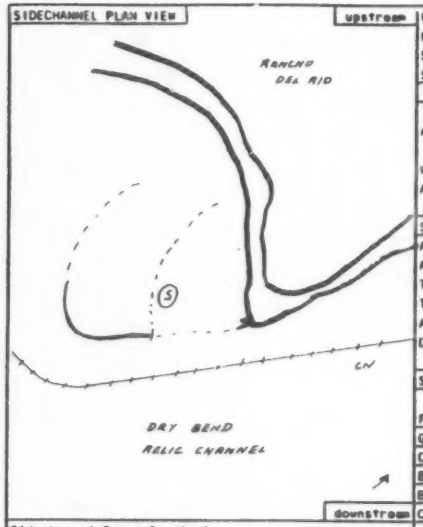
None

ENHANCEMENT ASSESSMENT

No practical options

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: CowICHAN
Watershed Code:
Sidechannel No. 47A NTS Map: 92 B/13
Site Location NEAR OUTLET
97 | 5 | 18 Time ____ Agency ____ Crew TB
yr mo day
Air Photo Location No. BCC 464 070 / 071
flight line photo nos.
Weather CLOUDY, COOL, SHOWERS Air Temp. °C 15
Access BOAT FROM ROSS DR. Water Temp. °C
HIKE FROM BIBLE CAMP

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	260	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	15	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	30

Gradient Profile: Longitudinal)

Comments:

I HAVE NEVER OBSERVED FLOW IN THIS CHANNEL

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 47R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
18/5/87	30	0	260	0	0	1560
30/5/86	50	0		0	0	

FISH UTILIZATION

None

ENHANCEMENT ASSESSMENT

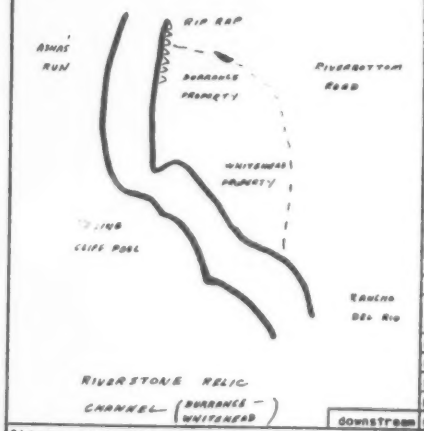
channel excavation and construction of an
inlet berm would provide permanent wetting &
would also provide benefit to WSN

Increased wetted area = 1560 m^2

Yield for = 499 CO smolts
780,000 cm fry
= 234 CT smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 48R NTS Map: 92 B/13
Site Location: 50 m BELOW HEAD
97 | 6 | 29 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BC 94049 flight line 660, 691 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 15
Access: RIVERBOTTOM RD Water Temp. °C: N/A
TO DURRANCE PROPERTY

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	9	Total Pool (%)		NA
Avg. Wetted Width (m)	6	Total Riffle (%)		
Total Length (m)	452 (10)	Total Run (%)		
Total Wetted Area (m^2)	180	Total Glide (%)		
Ave. Slope (%)	0.2	Total Slough (%)		
Debris (%)	NA	Turbidity (cm)		
		Total		100%

SUBSTRATE COMPOSITION

	%
Fines	B
Gravel	G
Cobbles	1
Boulders	D
Bedrock	O

Comments: SURFACE SUBSTRATE IS NOT RELEVANT: RIVER GRAVEL IS PRESENT JUST BELOW THE SURFACE

downstream

Compaction Hil L (M) H

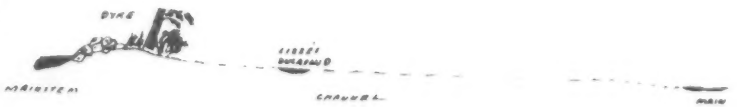
Sidechannel Cross-Section (downstream view)

LIEBEL DUCKPOND THE ONLY PERMANENT POOL IN THE CHANNEL

Sidechannel Discharge Summary

Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal



Comments:

A FEW LOW SPOTS ARE OCCASIONALLY WETTED BY THE WINTER WATER TABLE PERMANENT GROUND WATER IS PRESENT AT VARIABLE DEPTHS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 48R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length 452 (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
25/6/97	19	0	30	6	180	4067
3/9/97	7	0	24	2.5	62	
10/1/56	44	0	40	9	360	

FISH UTILIZATION: None

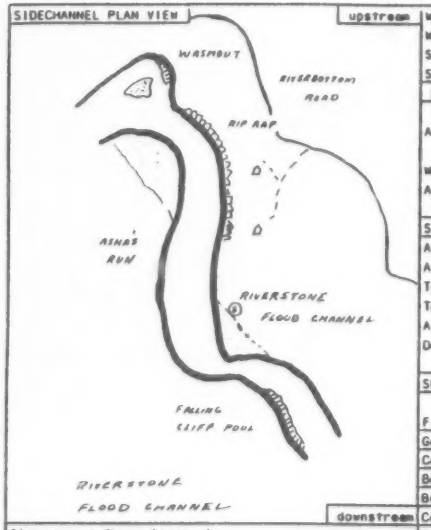
ENHANCEMENT ASSESSMENT: Channel excavation would provide cover and chum spawning & cover rearing and wintering. The dyke provides an excellent wetted berm.

Wetted area increase = 2000 m^2 (residual water is not available or accessible)

Yield pot: 180 cu smolts
450 ch smolts
1 034,000 cm fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 49F NTS Map: 92 B/13
Site Location: 20 m BELOW HEAD
87 | 6 | 29 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 040, 041 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 25
Access: RIVERBOTTOM RD Water Temp. °C: NA
TO RIVERSIDE PROPERTY

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	11	Total Pool (%)	NA
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	140	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	1	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	1	
Gravel	7	
Cobbles	1	
Boulders	1	
Bedrock	0	

Compaction Nil (L) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

ONLY WETTED DURING HIGH WINTER FLOWS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 49F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
26/2/86	145	3	140	5	700	1540
29/6/87	19	0	0	0	0	
2/4/87	44	0	0	4	0	

FISH UTILIZATION

CHUM spawning in most years. Eggs are usually lost however because the channel is dry at normal water levels.

Twenty-two chums spawned in this channel between Dec 1 and 10, 1987. By Dec 20, it was dry. Still distinct flow again by late spring.

ENHANCEMENT ASSESSMENT

lowering the weir and installing a drain will provide wetting. The berm above it should be strengthened.

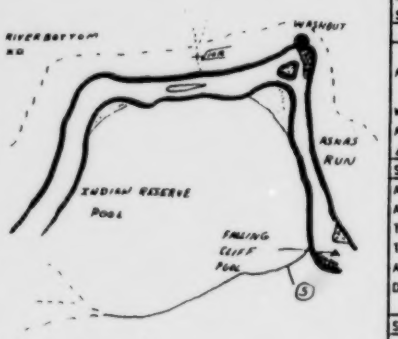
Wetted area accessible = 1540 m^2

Yield pot = 777,000 cm fry

Object of enhancement should be to provide wetland water chum fry emerge. Providing permanent flow is impractical and the channel has low capacity for rearing.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 50A NTS Map: 92 B/13
Site Location: 30 M ABOVE CONFLUENCE
87 | 7 | 17 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 flight line 640, 641, 642 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 22
Access: (BOAT) WADE COWICHAN AT Water Temp. °C: 14
BOTTOM OF ASNAS RUN OR HIKE FOOTPATH FROM FALLS CR

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool ($)	40
Avg. Wetted Width (m)	2	Total Riffle ($)	30
Total Length (m)	600	Total Run ($)	
Total Wetted Area (m^2)	1200	Total Glide ($)	30
Ave. Slope ($)	.1	Total Slough ($)	
Debris ($)	10	Turbidity (cm)	NIL
		Total	100$

SUBSTRATE COMPOSITION

	$
Fines	5
Gravel	5
Cobbles	1
Boulders	1
Bedrock	0

Comments:

downstream Compaction NIL (1) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	1.2
Wetted Width (m)	1.2
Avg. Depth (cm)	.04
Wetted X-Sec Area (m^2)	.048
Avg. Velocity (m/sec)	.17
Flow (m^3/sec)	.0063 (.019 CFS)
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

PART OF THE LARGEST SIDECHANNEL COMPLEX IN THE SYSTEM. LOCATED ON A 20 HA FLAT LACED WITH RELIC CHANNELS WETTED BY GROUNDWATER THAT LIKELY ORIGINATES FROM THE RIVER AQUIFER BECAUSE FLOW FLUCTUATES IN PHASE WITH RIVER DISCHARGE. HOWEVER, FLOW REDUCES SOMEWHAT FOLLOWING MINIMUM MAINSTEM LOW WATER SO OTHER GROUNDWATER ALSO CONTRIBUTES

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 50A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
3/5/86	27	.106	600	6	3600	4800
20/5/87	29	.018		4	2400	
12/7/87		.012		3	1800	
17/7/87		.0063		2	1200	
9/8/87	4.48	.004		1.3	720	
22/8/87	7	.004		1.2	720	
3/5/88	44	.13		8	4800	

FISH UTILIZATION

Coho spawn and overwinter in this channel. Spawning is heavy some years 100 – 300 m above the confluence. Cutthroat trout and lamprey eel spawn in this channel.

Fry densities (m^2) From Ho/1984

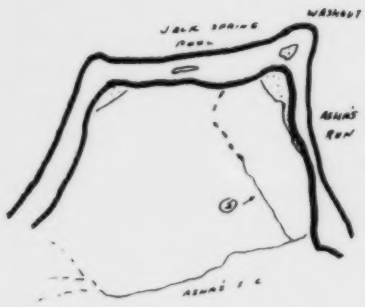
15/9/86 Co 2.3 Cr .77 12/4/86 Co .186 Cr .40

ENHANCEMENT ASSESSMENT

Some practical. It would be possible to provide more direct access for river flow by trenching but cost would be high and extra water flow might reduce habitat value. Reworking with relic channels might be feasible with extra summer flow. This possibility requires more study.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



LEANNE'S SIDECHANNEL

Watershed Name: LOWER ASHNOLA
Watershed Code:
Sidechannel No.: S1R NTS Map: 92 B/13
Site Location: 150 ASHNOLA OUTLET
97 | 7 | 17 Time: ____ Agency: ____ Crew: TM
yr mo day
Air Photo Location No.: BCC 904 flight line 040, 041, 042 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 22
Access: BOAT OR HORSE ACROSS Water Temp. °C: 14
ASHNOLA RUN IN RIVERBOTTOM 80

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	80
Avg. Wetted Width (m)	1	Total Riffle (%)	20
Total Length (m)	200 (MAP)	Total Run (%)	
Total Wetted Area (m^2)	122	Total Glide (%)	40
Ave. Slope (%)	1	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	3
Cobbles	1
Boulders	0
Bedrock	0

Comments:

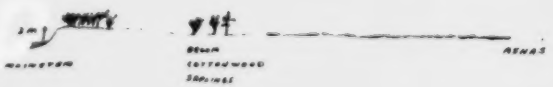
downstream Compaction Nil (1) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	4
Wetted Width (m)	4
Avg. Depth (cm)	02
Wetted X-Sec Area (m^2)	.08
Avg. Velocity (m/sec)	1
Flow (m^3/sec)	.00064
Mainstem Discharge (m^3/sec)	195

Gradient Profile: Longitudinal)



Comments:

UPPER 78 M IS A FLOOD CHANNEL THAT IS SELDOM WETTED. THE FUNCTIONAL LENGTH OF THIS CHANNEL IS 122 M

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. S1R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
15/5/97	30	.02	122	1.5	183	244
17/7/97	195	.00064	122	1	122	
9/9/97	448	0	122	.39	95	
22/9/97	7	0	122	.39	95	

FISH UTILIZATION

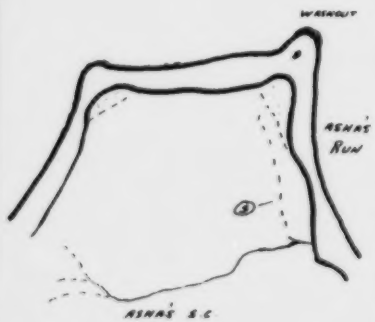
Coho fry utilize this channel in winter, spring and early summer. By late summer, only one 40 m^2 pool remains as a refuge for less than 100 fish. Other pools are present but too small and shallow to hold fry.

ENHANCEMENT ASSESSMENT

Excavation of a deep infiltration pool at 122 M would, in combination with spot trenching, provide permanent flow. But yield could not justify cost.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 52F NTS Map: 92 B/13
Site Location: NEAR BOTTOM END
87 | 9 | 9 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 041, 042 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 34
Access: WADE OR BOAT Water Temp. °C:
ASHAS RUN

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	230	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.3	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

Compaction Nil L M(H)

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE AND LARGE FRESHETS.
MAY NOT FLOW IN LOW RUN-OFF WINTERS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 52F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length 230 (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
12/7/87		0	230(+)	2	10	1560
9/8/87	2.48	0	0	0	0	
8/5/87	30	0	10	3	30	
3/4/87	94	0	14	4	56	

FISH UTILIZATION

Coho fry find their way into the lower end during the winter and early spring. Since the channel dries by May or early June, some are lost. Number is usually less than 100.

ENHANCEMENT ASSESSMENT

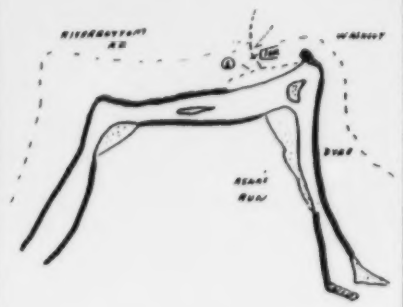
The channel could be excavated for combination chum spawning - coho rearing but priority should be low due to benefits and because better sites are present

Increased wetted area = 1560 m^2
Yield pot = 499 CO SMOLTS
249 CH SMOLTS
780,000 CH Fry

Inlet berm modification will be necessary

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



WASHOUT FLOOD CHANNEL

upstream

Watershed Name: CHILCHAN
Watershed Code:
Sidechannel No.: 53F NTS Map: 92 B/13
Site Location: NEAR CENTER
Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC A69 flight line 691, 693 photo nos.
Weather: CLOUDY, COOL Air Temp, °C: 10
Access: FROM RIVERBOTTOM RD Water Temp, °C: NA
IT'S POSSIBLE TO RAISE DOWN THIS CHANNEL MOST OF THE YEAR

SIDECHANNEL SUMMARY

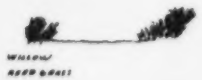
Avg. Chan. Width (m)	20	Total Pool ($)	NA
Avg. Wetted Width (m)	0	Total Riffle ($)	
Total Length (m)	200	Total Run ($)	
Total Wetted Area (m^2)	0	Total Glide ($)	
Ave. Slope ($)	.1	Total Slough ($)	
Debris ($)	1	Turbidity (cm)	
		Total	100$

SUBSTRATE COMPOSITION

	$	Comments:
Fines	3	
Gravel	5	
Cobbles	2	
Boulders	0	
Bedrock	0	

downstream Compaction NIL L M H

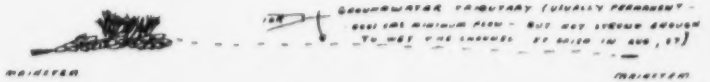
Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal


GROUNDWATER TRIBUTARY (USUALLY PERMANENT - HAS LOW MINIMUM FLOW - BUT NOT STRONG ENOUGH TO KEEP CHANNEL OF SAME IN AUG, ST)
MAINSTEM
MAINSTEM

Comments:

ONLY WETTED IN HIGH FLOWS. AT "NORMAL" WINTER DISCHARGE (≈ 60 L/S), A FEW SHALLOW POOLS ARE PRESENT

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 53F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
5/8/95	37	0	200	0	0	4000
1/1/97		0		0	0	
27/12/99	50	0		1	1	

FISH UTILIZATION

None

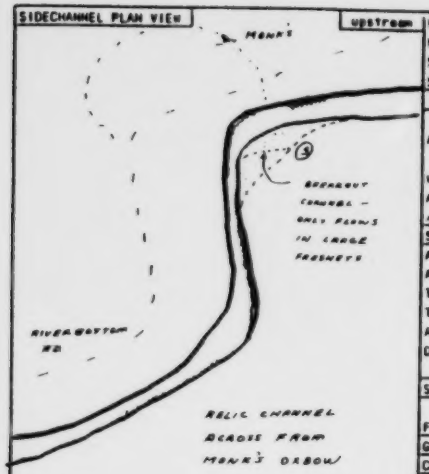
ENHANCEMENT ASSESSMENT

It would be possible to excavate this channel. Chum salmon would benefit most, but coho advantages should also result.

Wetted area increase = 4000 m^2
Yield per = 1250 CO SMOLTS
= 2,000,000 CM fry
= 640 CO SMOLTS

SIDECHANNEL ASSESSMENT Form

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 34R NTS Map: 92 B/13
Site Location: CENTRAL
87 | 7 | 17 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 949 flight line 891 / 843 photo nos.
Weather: MOSTLY CLEAR, WARM Air Temp. °C: 25
Access: BOAT OR WADE FROM ABBOTSFORD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	4	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	310	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	15	Turbidity (cm)	
		Total	100%

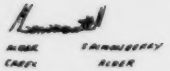
SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal

Comments:

WETTED BY THE WINTER WATER TABLE AND OCCASIONAL FLOODING VIA A BREAKOUT CHANNEL. BACKFLOODING OCCURS IN THE LOWER 50m

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 34R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
17/7/87		0	310	0	4	1340
2/10/87		0	310	0	0	

FISH UTILIZATION

Coho wintering and spring rearing in the lower 60m.

ENHANCEMENT ASSESSMENT

Excavation could produce a small chum salmon spawning channel and improved coho rearing. The berm should be left intact.

Wetted area increase = 1240 m^2

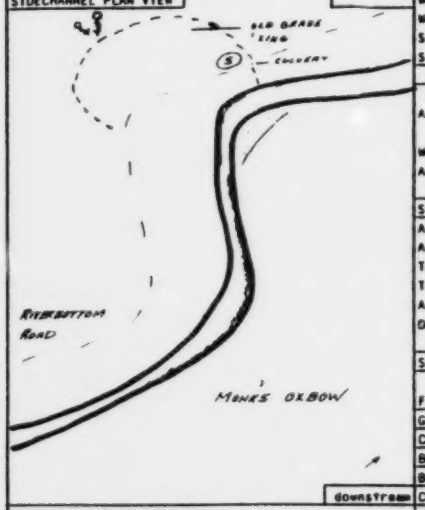
Yield: DOY = 396 CO SMOLTS

= 620,000 OM fry

= 191 CA SMOLTS

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 55A NTS Map: 92 B/13
Site Location: MARC OUTLET
17 | 9 | 97 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 (flight line) 041, 042 (photo nos.)
Weather: CLEAR, HOT Air Temp. °C: 33
Access: RIVERBOTTOM RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	610	Total Run (%)	
Total Wetted Area (m^2)	100	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

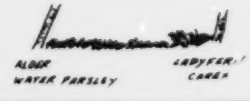
SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	3
Cobbles	1
Boulders	0
Bedrock	0

Comments: GRAVEL AND COBBLES JUST UNDERNEATH

downstream Compaction Nil L (M) H

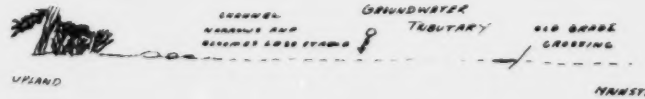
Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)



Comments:

WETTED BY

1 WINTER WATER TABLE

2 WINTER BACKFLOODING (LOWER 50M)

3. A SMALL GROUNDWATER TRIBUTARY (.0001 CMS MINIMUM FLOW - NOT ENOUGH TO REACH THE SIDECHANNEL IN LATE SUMMER)

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 55A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/4/97	45	.023	610	5	3050	6100
19/5/97	30	.020	610	4	2440	
25/5/97	20	.0072	500	3	1500	
8/9/97	4.45	0	10	.001	100	
2/10/97		0	10	.001	100	

FISH UTILIZATION

Coho wintering and spring - early summer rearing.

ENHANCEMENT ASSESSMENT

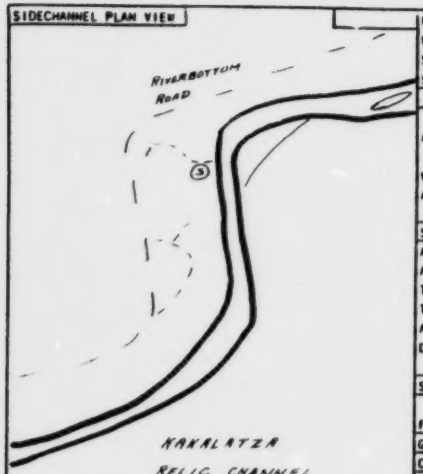
A deep infiltration pool and spot excavation could provide permanent wetting

Wetted area increase = 6000 m^2

Yield pot = 1920 CO smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 56R NTS Map: 92 B/13
Site Location: NEAR RIVER
87 | 9 | 18 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 (flight line) 041, 042 (photo nos.)
Weather: CLEAR, WARM Air Temp. °C: 25
Access: RIVER BOTTOM RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	200	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	NA	Turbidity (cm)	
		Total	100%

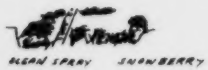
SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Hil L M(H)

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

AN OLD POST - GLACIAL CHANNEL LONG REMOVED FROM ACTIVE STATUS; NEVER WETTED

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 56R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length 200 (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
18/9/87	7	0	200(+)	0	0	NA
16/1/26	59	0	0	0	0	

FISH UTILIZATION

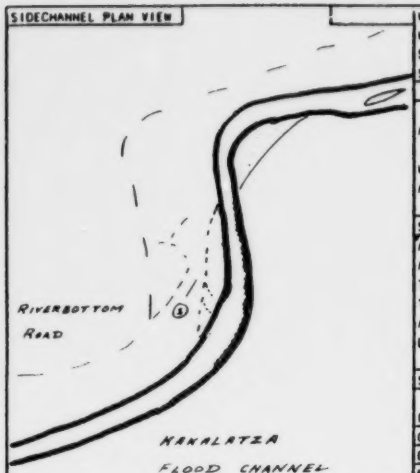
None - channel never wetted

ENHANCEMENT ASSESSMENT

Beyond the range of enhancement

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 37F NTS Map: 92 B/14
Site Location: NEAR
87 | 7 | 1 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 041, 042 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 29
Access: RIVERBOTTOM RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	165	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

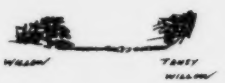
SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	7
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	19

Gradient Profile:
Longitudinal)

Comments:

INUNDATED BY FLOODS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 37F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
18/5/87	30	0	265	.894	225	1650
1/7/87	19	0		0	0	

FISH UTILIZATION

Coho, chinook and chum fry enter the channel from its lower end in April and May but become trapped when water recedes in May and June. Fish are very difficult to salvage and annual losses approximate 100 - 300 fry; mostly coho.

ENHANCEMENT ASSESSMENT

The area is too unstable to support most measures.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW — upstream

downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 58F NTS Map: 92 B/13
Site Location: CENTRAL
87 | 4 | 1 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 (flight line) 042, 043 (photo nos.)
Weather: CLOUDY Air Temp. °C: 10
Access: RIVERBOTTOM RD, WILDWOOD RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	12	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	194	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.3	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

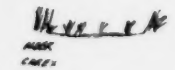
SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil (L) M H

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

ONLY OCCASIONALLY WETTED DURING FRESHETS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 58F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
1/4/87	40	0	194	0	0	2328

FISH UTILIZATION

None

ENHANCEMENT ASSESSMENT

Conditions are favourable for chum salmon spawning if a channel were excavated. An inlet control structure would be necessary as would protection from mainstem lateral cutting and inundation.

Wetted area increase: 2328 m^2

Yield pot: 1,164,000 cm fry

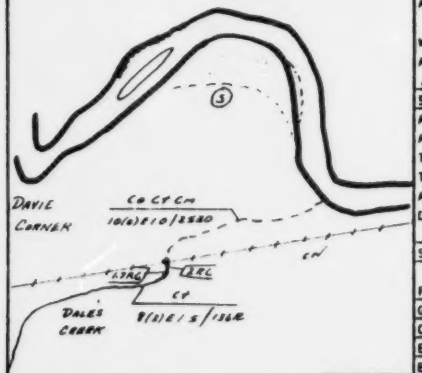
It would be impractical to provide permanent flow to the channel

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream

DALES FLOODCHANNEL



downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 59F NTS Map: 92 B/13
Site Location: CENTRAL
87 / / Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 042, 043 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 30
Access: SHUTEFALLS - HOLT Water Temp. °C:
CR RD., CN TRACKS, COW FOOTPATH

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	348	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

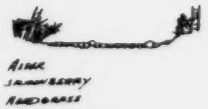
SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	6
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction Nil (1) M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 59F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
15/5/87	30	0038	248	3	744	3480
1/7/87	19	0	0	0	0	

FISH UTILIZATION

Coho and chum salmon spawning. Coho rearing until early summer. 300 - 700 are lost to drying which usually occurs from late May to late June

ENHANCEMENT ASSESSMENT

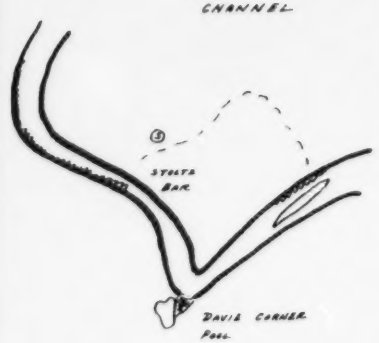
Excavation of an infiltration gallery near the inlet combined with drainage under the inlet berm should provide permanent wetting

Wetted area increase 348 to 1114 m^2

Yield 80% 1136 to 908 smolts
1,146,000 to 916,800 Fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 60R NTS Map: 92 B/13
Site Location: NEAR HEAD
87 | 4 | 1 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 043, 044 photo nos.
Weather: CLOUDY Air Temp. °C: 10
Access: RIVERBOTTOM RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	900	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	NA	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

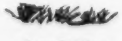
	%
Fines	
Gravel	
Cobbles	
Boulders	
Bedrock	

Comments:

downstream

Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

A POST-GLACIAL CHANNEL LONG REMOVED FROM RIVER INFLUENCE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 60R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
1/4/87	40	0	900	0	0	7200

FISH UTILIZATION

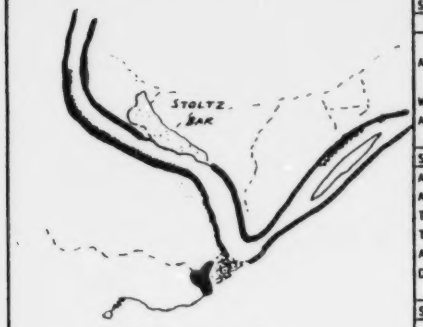
None

ENHANCEMENT ASSESSMENT

No improvement possible

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 618 NTS Map: 92B/13
Site Location:
Date: 87 | 5 | 26 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 043, 044 photo nos.
Weather: Air Temp. °C:
Access: STUTE FALLS – HOLT CR. ACCESS RD Water Temp. °C: 14

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	100	Total Pool (%)	
Avg. Wetted Width (m)	35	Total Riffle (%)	
Total Length (m)	70	Total Run (%)	
Total Wetted Area (m^2)	2450	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	100
Debris (%)	40	Turbidity (cm)	20
		Total	100%

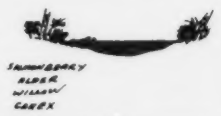
SUBSTRATE COMPOSITION

	%	Comments:
Fines	8	
Gravel	2	
Cobbles	0	
Boulders	0	
Bedrock	0	

Compaction NIL L M(H)

downstream

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

BACKFLOODS IN WINTER, BECOMES DETATCHED IN SPRING OR EARLY SUMMER BUT RECEIVES PERMANENT (ALBEIT SMALL) INFLOW FROM GROUNDWATER SEEPAGE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 618 Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
15/5/87	30	0	72	36	2592	7000
28/5/87	20	0	70	35	2450	
9/7/87	448	0	68	33	2244	

FISH UTILIZATION

Coho wintering and summer rearing

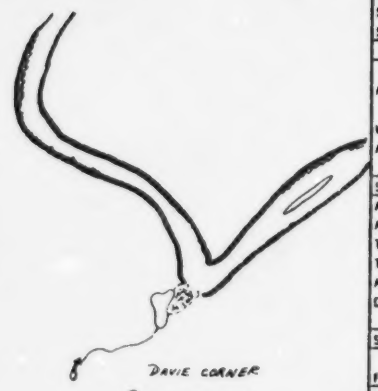
ENHANCEMENT ASSESSMENT

No improvement required

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream



downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 618-R NTS Map: 92 B/8
Site Location:
87 | 8 | 9 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 043,044 photo nos.
Weather: CLEAR; HOT Air Temp. °C: 32
Access: SKUTZ FALLS - HOLT CR. RD; COW FOOTPATH Water Temp. °C: 12

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	11	Total Pool (%)	57
Avg. Wetted Width (m)	.58	Total Riffle (%)	32
Total Length (m)	180	Total Run (%)	
Total Wetted Area (m^2)	1044	Total Glide (%)	11
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	15	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction NIL L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.59
Wetted Width (m)	.56
Avg. Depth (cm)	.035
Wetted X-Sec Area (m^2)	.0203
Avg. Velocity (m/sec)	.1175
Flow (m^3/sec)	.0018
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile:
Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 618-R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
15/5/87	30	.028	180	.8	144	1980
26/5/87	20	.009	180	.8	144	
8/8/87	4.48	.0018	180	.58	144.4	

FISH UTILIZATION

Coho spring - summer rearing and probability of overwintering

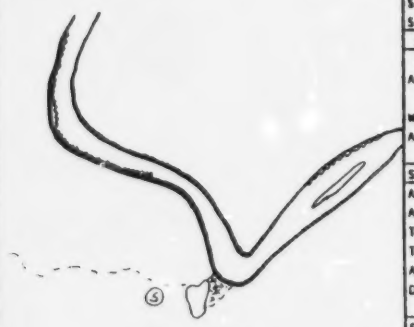
ENHANCEMENT ASSESSMENT

No improvement required

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream



DAVIE CORNER
RELIC CHANNEL NO. 1

downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 62R NTS Map: 92 B/12
Site Location:
87 | 4 | 6 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 043 ; 044 photo nos.
Weather: Air Temp. °C:
Access: Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	300	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.001	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

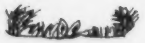
SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Inspection Hil L M(H)

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

WETTED BY THE WINTER WATER TABLE AND BACKFLOODING

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 62R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
6/4/87	35	0	300	0	0	3000

FISH UTILIZATION

Possibility of coho wintering but smolt emigration is questionable

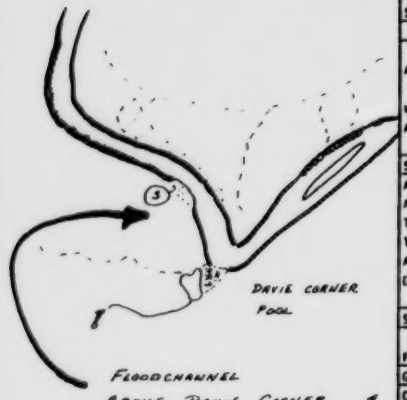
ENHANCEMENT ASSESSMENT

Not subject to enhancement - no practical opportunities present

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream



downstream

Watershed Name: COWICHAN

Watershed Code:

Sidechannel No.: 63F NTS Map: 92 B/13

Site Location: NEAR HEAD

87 | 4 | 6 Time: Agency: Crew: TB
yr mo day

Air Photo Location No.: BCC 404 flight line 043, 044 photo nos.

Weather: Air Temp. °C:

Access: Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	65	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	2	Turbidity (cm)	
		Total	100%

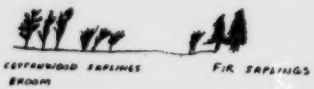
SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED ONLY VERY OCCASIONALLY BY MAINSTEM SPILL

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 63F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
6/4/87	35	0	65(+)	0	0	650
15/1/86	60	0	*	0	*	

FISH UTILIZATION

Nil

ENHANCEMENT ASSESSMENT

no improvement opportunities are present

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 64F NTS Map: 92 B/13
Site Location: 100 M ABOVE OUTLET
17 / 4 / 4 (yr mo day) Time: 1100 Agency: Crew: TB
Air Photo Location No.: BC 409 flight line 045, 044 photo nos.
Weather: CLOUDY, COOL Air Temp. °C: 7
Access: FROM STOLTZ RD Water Temp. °C: 8

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	400	Total Run (%)	
Total Wetted Area (m^2)	100	Total Glide (%)	
Ave. Slope (%)	5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	4
Gravel	6
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	0
Mainstem Discharge (m^3/sec)	40

Gradient Profile:
Longitudinal)

Comments:

ONLY FLOWS PERMANENTLY IN FLOODS.

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 64F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
4/4/97	40	0	400	.06	200	3200
28/4/97	32	0		.025	50	
30/0/97	19	0			0	
10/12/96		0	0	.02	8	

FISH UTILIZATION

Coho, chinook and chum fry enter this channel from its bottom end in the spring. Numbers may be high in years of early emergence. 500 chinook fry, 300 coho fry, 500 chum fry and 5 coho pre-smolts were salvaged between April 4 and 28, 1997.

3/2 chums spawned in this channel between Dec. 6 and 10, 1997. An additional 6% spawned in the upper reach behind the road to Broadleaf's Pool. All eggs were lost to drying.

ENHANCEMENT ASSESSMENT

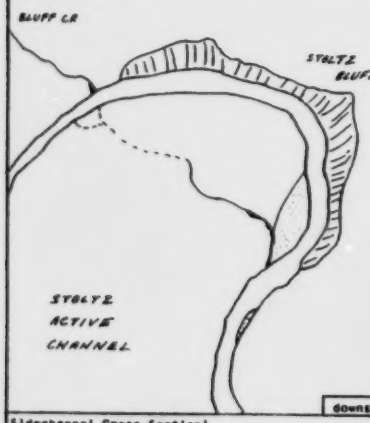
No practical enhancement options. The channel could be excavated to prolong flow but benefits would be very temporary due to the unstable nature of the channel and adjacent bar. However, it may be possible to defend a channel against small floods.

Wetted area increase = 3200 m^2

Yield pot = 1,600,000 chi fry
= 512 ch smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: CAMERON
Watershed Code:
Sidechannel No.: 65A NTS Map: 92 B/13
Site Location: CENTRAL
17 | 8 | 4 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line: 045, 044 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 33
Access: SKUTZ FALLS – HALT CR Water Temp. °C: 15.5
RD. OR WADE RIVER

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	12	Total Pool (%)	66
Avg. Wetted Width (m)	5	Total Riffle (%)	29
Total Length (m)	435	Total Run (%)	
Total Wetted Area (m^2)	2175	Total Glide (%)	5
Ave. Slope (%)	5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	#	Comments:
Fines	1	
Gravel	5	
Cobbles	4	
Boulders	1	
Bedrock	0	

downstream

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	1.6
Wetted Width (m)	1.6
Avg. Depth (cm)	.045
Wetted X-Sec Area (m^2)	.072
Avg. Velocity (m/sec)	.3
Flow (m^3/sec)	.01728
Mainstem Discharge (m^3/sec)	7

Gradient Profile: Longitudinal)

Comments:

A MAJOR SIDECHANNEL, CARRYS HEAVY DISCHARGE IN FRESHETS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 65A Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
6/4/87	35	.45	742	8	5936	8904
26/5/87	195	.044	572	6	3432	
7/8/87	7	.01728	435	5	2175	
9/8/87	448	.0054	435	4.6	2001	

FISH UTILIZATION

Coho and chum salmon spawning, coho summer rearing. The overwintering capability of this channel is suspect due to heavy flushing and bed load transport at times

ENHANCEMENT ASSESSMENT

Excavation of an infiltration pool near the inlet might provide permanent wetting, particularly in conjunction with a buried pipe or French drain

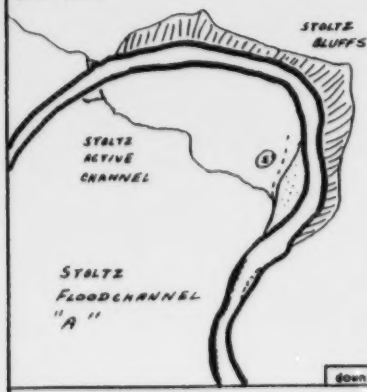
Wetted area increase = 6903 m^2

Yield pot = 2208 CO smolts

Improvement of the inlet berm would reduce scour

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 66F NTS Map: 92 B/13
Site Location:
87 | 4 | 6 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line: 043, 044 photo nos.
Weather: CLOUDY, COOL Air Temp. °C: 12
Access: SKUTZ FALLS - HOLT CREEK ROAD Water Temp. °C: 8

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	100	Total Run (%)	
Total Wetted Area (m^2)	5	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	N/A
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	8
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

WETTED BY THE WINTER WATER TABLE AND OCCASSIONAL SPILL FROM THE RIVER

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 66F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
6/5/87	35	0	100	0	5	500

FISH UTILIZATION

light coho and chum spawning; 450 chum and 50 coho fry were salvaged 6/4/87.

ENHANCEMENT ASSESSMENT

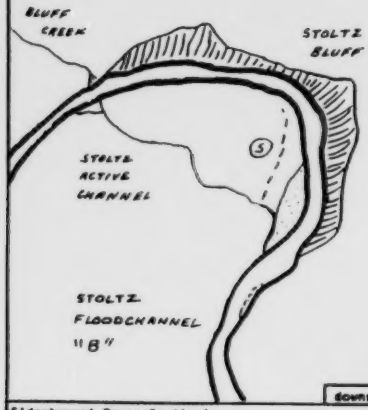
Excavating an infiltration pool near the inlet may prolong wetting. Additional measures are not justified. This would guarantee chum fry survival

Wetted area increase = 500 M^2

Yield potential = 250,000 chum fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 67F NTS Map: 92B/13
Site Location
87 | 6 | 4 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 flight line 043, 044 photo nos.
Weather: CLOUDY, COOL Air Temp. °C: 12
Access: SKUTZ FALLS – HOLT CREEK ROAD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	200	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	1	Turbidity (cm)	
		Total	100%

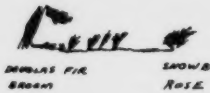
SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	7
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Hil L (M) H

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

A DIFFICULT CHANNEL TO CHARACTERIZE. WETTED BY FLOODING BUT ON AN INFREQUENT BASIS; ONCE IN 5 TO 10 YEARS?

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 67F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length 2 ea (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
6/4/87	35	0	200 (1)	0	0	1000
30/5/86	50	0	"	"	"	

FISH UTILIZATION

Nil

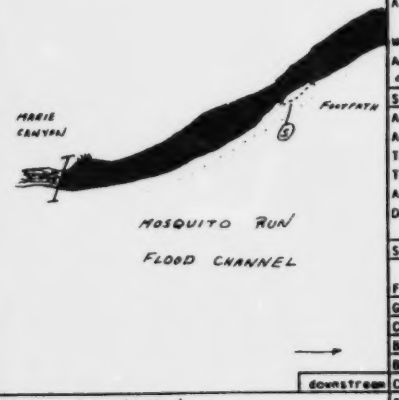
ENHANCEMENT ASSESSMENT

Major excavation would be required to bring this channel into production. It has fair potential as a chum spawning channel and could also rear coho as a secondary benefit

Wetted area increase = 1000 m^2
Yield pot = 500,000 cm Fry
= 320 coho smolts
= 160 Chinook smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 68F NTS Map: 92B/13
Site Location:
87 | 8 | 4 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 082, 083 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 30
Access: SKUTZ FALLS, HOLT Water Temp. °C: 20.5
CR. RD, COWICHAN FOOTPATH

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	100
Avg. Wetted Width (m)	6	Total Riffle (%)	
Total Length (m)	140(40)	Total Run (%)	
Total Wetted Area (m^2)	840	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	2	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	7
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction NIL (L) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	7

Gradient Profile: Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 68F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length 140 (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
6/4/87	35	.32	140	4	560	1120
26/5/87	19.5	.029	140	3	420	
4/8/87	7	0	40	6	240	
8/9/87	4.48	0	31	5	155	

FISH UTILIZATION

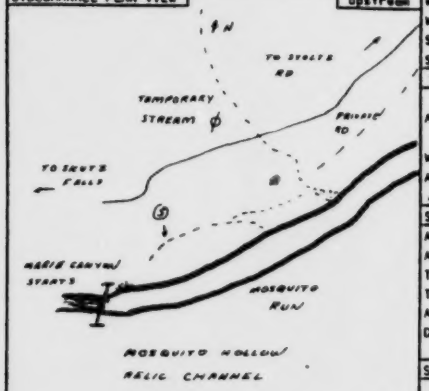
Coho spring and early summer rearing

ENHANCEMENT ASSESSMENT

No enhancement opportunities are present The unit is too unstable for modification to hold

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 69R NTS Map: 92 B/13
Site Location: 150 m ABOVE LOWER END
97 | 6 | 27 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 072, 093 photo nos.
Weather: CLEAR; WARM Air Temp. °C: 21
Access: BOOMER RD THEN PATH Water Temp. °C: —
FROM W. RIVER BOTTOM RD

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	7	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	180	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments: GRAVEL UNDERNEATH

downstream

Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary	NA
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SUSTAINS A FEW POOLS OF SURFACE WATER FROM NOVEMBER TO EARLY MAY. WETTED BY SEEPAGE FROM THE UPLAND AND THE WINTER WATER TABLE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 69R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
4/4/97	39	0	180(e)	0	0	1260

FISH UTILIZATION

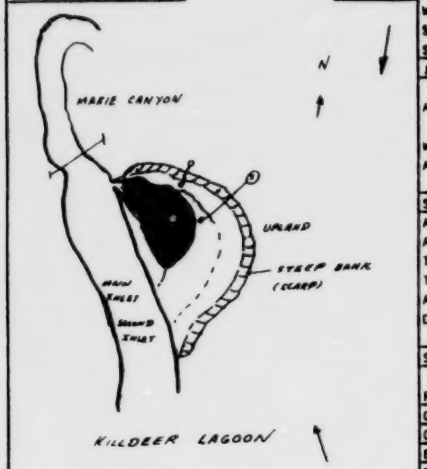
None

ENHANCEMENT ASSESSMENT

No improvement possible without great expense. Benefit would be negligible.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 70A-Basin NTS Map: 92 B/13
Site Location:
87 | 6 | 27 (yr mo day) Time: 1500 Agency: Crew: TB
Air Photo Location No.: BC 404 (flight line) 034, 035 (photo nos.)
Weather: CLEAR, WARM Air Temp. °C: 25
Access: COWICHAN FOOTPATH Water Temp. °C: 15

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	100
Avg. Wetted Width (m)	15	Total Riffle (%)	
Total Length (m)	50	Total Run (%)	
Total Wetted Area (m^2)	750	Total Glide (%)	
Ave. Slope (%)	.0001	Total Slough (%)	
Debris (%)	0	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	6
Cobbles	0
Boulders	0
Bedrock	1

Comments: GROUNDWATER UPWELLING THROUGH SUBSTRATE

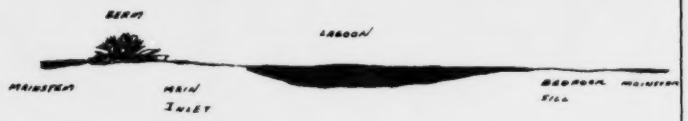
Compaction Nil (0) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	TWO OUTFLOW CHANNELS
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	.034 (1.35 CFS)
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal



Comments:

A UNIQUE GROUNDWATER UPWELLING BASIN
20 PER CENT OF ITS FLOW IS SUPPLIED BY
GROUNDWATER (ON THIS DATE) - 86/6/27.
COHO, STEELHEAD, CUTTHROAT AND BROWN TROUT FRY
WERE PRESENT:
CO 45 - 65 MM CT 38 MM
ST 85 MM BT 44 MM

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No.: 70A-BASIN

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
27/6/87	20	.034	50	15	750	750
29/7/87		.019		14	700	
9/8/87	4.48	.017		14	700	

FISH UTILIZATION

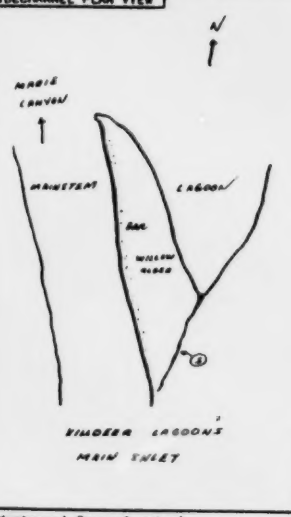
Coho, cutthroat, steelhead and brown trout fry are summer residents. It is suspected that they are progeny of spawners because the lagoon enters a step riffle just above Marie Canyon and its outlets are swift in the spring (.35 and .5 M/sec on June 27/87). Strong possibility of over wintering by all resident species

ENHANCEMENT ASSESSMENT

None necessary

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 70A NTS Map: 92 B/13
Site Location: NEAR INLET
87 | 6 | 27 (yr / mo / day) Time: 1330 Agency: Crew: TB
Air Photo Location No.: BC 904 flight line: 084, 085 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 25
Access: COWICHAN R. FOOTPATH Water Temp. °C: 16.5

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	3	Total Pool (%)	20
Avg. Wetted Width (m)	2	Total Riffle (%)	80
Total Length (m)	30	Total Run (%)	
Total Wetted Area (m^2)	60	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	4
Cobbles	5
Boulders	0
Bedrock	0

Comments:

downstream Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	1.2
Wetted Width (m)	1.2
Avg. Depth (cm)	.05
Wetted X-Sec Area (m^2)	.06
Avg. Velocity (m/sec)	.35
Flow (m^3/sec)	.012 (.42 CFS)
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

SPRING - SUMMER FLOW PROVIDED BY SEEPAGE THROUGH THE INLET BERM WHICH IS OCCASIONALLY OVERTOPPED BY WINTER FLOWS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 70A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
27/6/87	20	.012	30	2	60	90
29/7/87		.0072		1.5	45	
8/8/87	4.48	.0057		1.2	36	

FISH UTILIZATION

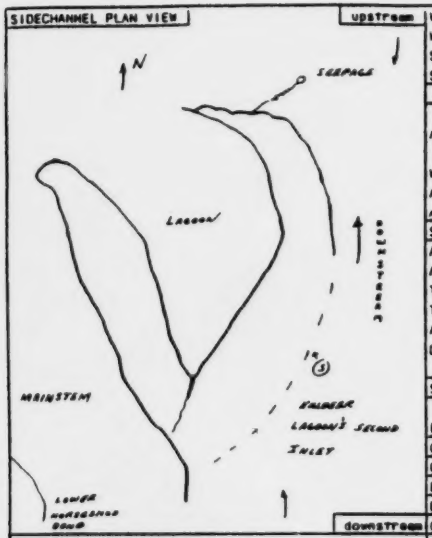
Supports about 40 coho fry in summer. Very slight chance of a few coho spawners. Overwintering capability is considered unit

ENHANCEMENT ASSESSMENT

No improvement required assuming the inlet berm to mainstem flow could reduce the capability of this highly unique complex

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN

Watershed Code:

Sidechannel No.: 70A-LOWER Map: 92 B/13

Site Location: NEAR INLET

17 | 6 | 87 Time: 1550 Agency: Crew: TB

yr mo day

Air Photo Location No.: BC 404 flight line 084, 085 photo nos.

Weather: CLEAR; WARM Air Temp. °C: 26

Access: COWICHAN FOOTPATH Water Temp. °C: 10.5

FROM SOUTH FALLS ON WADE RIVER AT LOWER H3 BEND

SIDECHANNEL SUMMARY * ONLY THE LOWER 90 m

Avg. Chan. Width (m)	2	Total Pool (%)	30
Avg. Wetted Width (m)	.5	Total Riffle (%)	70
Total Length (m)	120	Total Run (%)	
Total Wetted Area (m^2)	15 *	Total Glide (%)	
Ave. Slope (%)	.3	Total Slough (%)	
Debris (%)	30	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	7
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Connection Nil (L) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.2
Wetted Width (m)	.2
Avg. Depth (cm)	.035
Wetted X-Sec Area (m^2)	.007
Avg. Velocity (m/sec)	.13
Flow (m^3/sec)	.0007 (.026 CFS)
Mainstem Discharge (m^3/sec)	20

Gradient Profile: Longitudinal)

Comments:

PRIMARY FLOW SOURCE IS UPLAND SEEPAGE AND THE WINTER WATER TABLE. FLOOD FLOWS MAY OCCASIONALLY WET THE UPPER 90 M

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 70A-Lower / Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
27/6/87	20	.0007	120 *	.5	15	240
29/7/87		.0017	(90 m WET	.5	15	
8/8/87	4.48	.0017	WETTED L.)	.5	15	

FISH UTILIZATION

Too small for coho spawning or summer rearing; possible coho winter habitat

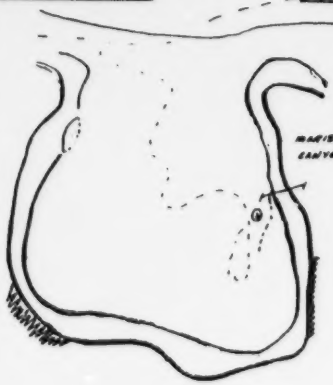
ENHANCEMENT ASSESSMENT

Excavation of a deep infiltration pool near the berm may provide enough summer flow for coho rearing. However, only 240 fry could be carried and there is no access for heavy equipment.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream



downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 71R NTS Map: 92 B/13
Site Location: 50 m ABOVE OUTLET
87 | 4 | 2 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 484 flight line 017, 018 photo nos.
Weather: ____ Air Temp. °C: ____
Access: ____ Water Temp. °C: ____

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	3	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	112	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	
Cobbles	0
Boulders	0
Bedrock	

Comments:

Compaction NIL L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 71R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
2/4/87	44	0	112	0	0	336

FISH UTILIZATION

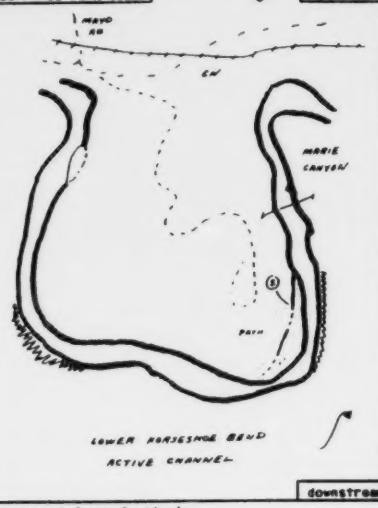
None

ENHANCEMENT ASSESSMENT

no practical improvement opportunities

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 72A NTS Map: 92 B/13
Site Location: CENTRAL
17 | 9 | 9 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC404 flight line 084, 085 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 30
Access: MAYO RD, BCFS RCC Water Temp. °C: 12.5
SITE RD, TRAILS

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	55
Avg. Wetted Width (m)	3.7	Total Riffle (%)	40
Total Length (m)	314	Total Run (%)	
Total Wetted Area (m^2)	1135	Total Glide (%)	10
Ave. Slope (%)	1.0	Total Slough (%)	
Debris (%)	1	Turbidity (cm)	N/L
		Total	100%

SUBSTRATE COMPOSITION

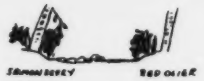
	%
Fines	1
Gravel	5
Cobbles	3
Boulders	1
Bedrock	0

Comments:

downstream

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.5
Wetted Width (m)	.2
Avg. Depth (cm)	.07
Wetted X-Sec Area (m^2)	.014
Avg. Velocity (m/sec)	.2
Flow (m^3/sec)	.00324 (.079 CFS)
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile:
Longitudinal)

Comments:

THIS CHANNEL IS WETTED BY SUBSURFACE WATER THROUGH THE BERM AND LATERALLY THROUGH THE BAR

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 72A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/3/87		3.0	314	10	3140	3140
25/4/87	35	.0308		5	1570	
27/5/87	19	.003		4.5	1413	
29/7/87		.004		4.5	1413	
1/8/87	4.48	.002		3.7	935	
26/9/86	9.00	.004		4.5	1420	

FISH UTILIZATION

Two channel supports coho and chum spawning and coho summer rearing. A few (< 300) coho fry are trapped in the middle section between May and July.

Fry densities from Nolfby (pers. comm.)

Co .67 10/9/86

Co 4.90 12/4/86

ENHANCEMENT ASSESSMENT

Peak flows are far too high and summer discharge is too low. Raising the weir berm and excavating the upper 30 M could reduce high flows and increase summer discharge.

Wetted area increase = 2305 m^2

Yield pot = 797 Co smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream

Watershed Name: CONICHAN

Watershed Code:

Sidechannel No.: 73R NTS Map: 92 O/13

Site Location:

96 | 5 | 11 Time: 1300 Agency: Crew: TB

yr mo day

Air Photo Location No.: BCC 409 flight line: 057, 058 photo nos.

Weather: CLOUDY, COOL Air Temp. °C: 8

Access: CONICHAN FOOTPATH Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	7	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	266	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	30	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	1
Cobbles	1
Boulders	0
Bedrock	0

Comments: GRAVEL AND COBBLES UNDERNEATH

downstream

Compaction: NIL L M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE (A FEW POOLS)
AND OCCASSIONAL LIGHT SPILL FROM THE MAINSTEM
IN VERY HIGH WATER LOWER 20 M BACKFLOODS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 73R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
8/5/96	20	0	266	0	0	1862
11/5/96	20	0				
20/4/97	45	0				
30/6/97	21	0				

FISH UTILIZATION

3 pair coho may utilize the backwater portion of this channel in the spring; chinook also

ENHANCEMENT ASSESSMENT

Excavation of a deep infiltration pool below the inlet berm could provide permanent rearing

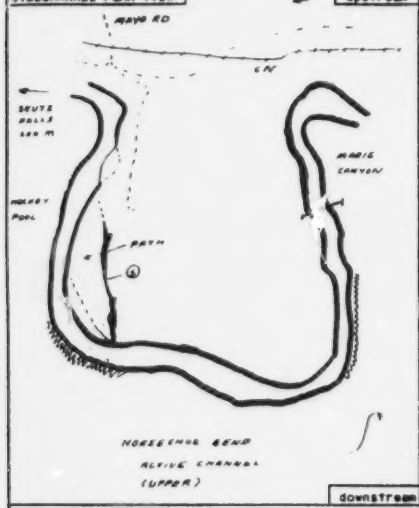
Wetted area increase = 1862 m^2

Yield est = 545 coho smolts

= 297 CH smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: CAMELMAN
Watershed Code:
Sidechannel No.: 74A NTS Map: 92 A/13
Site Location: MID-CHANNEL CONSTRICTION
87 | 8 | 7 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 035, 016
(flight line) photo nos.
Weather: CLEAR, HOT Air Temp. °C: 32
Access: MAYO RD Water Temp. °C: 18

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	12	Total Pool (%)	100
Avg. Wetted Width (m)	9	Total Riffle (%)	
Total Length (m)	250	Total Run (%)	
Total Wetted Area (m^2)	2000	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	6	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	5
Cobbles	2
Boulders	1
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	INT POOLS
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile:
Longitudinal)

Comments: THE CHANNEL IS BUFFERED BY A MATURE BEAM

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 74A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/3/87		.14	250	12	3000	3000
22/4/87	35	.078		8	2000	
19/5/87	30	.022		6	1500	
27/5/87	19	.0072		6	1500	
29/7/87	.	.0021		5	1250	
3/8/87	4.48	INT		5	1250	
3/9/86	20	.022		6	1500	

FISH UTILIZATION

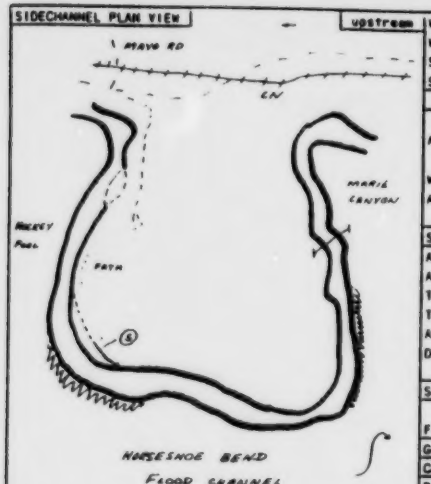
coho spawn, rear and winter in this channel.
22 spawned out in 1985 a few chums may also utilize this channel

ENHANCEMENT ASSESSMENT

No physical modification is required but, due to very high spring - early summer coho fry densities, planning is necessary to prevent large scale siltation over the summer. Early summer fry usually number about 10,000 (13 per M^2) and late summer carrying capacity @ 1 fry / m^2 is 1250. 8750 coho fry should be salvaged in most years. 6750 were salvaged in 1986 (Burns, et al 1987)

SIDECHANNEL ASSESSMENT Form

SIDECHANNEL PLAN VIEW



downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 75F NTS Map: 92 B/13
Site Location: NEAR OUTLET
17 / 8 / 87 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 flight line 015, 016 photo nos.
Weather: CLEAR ; HOT Air Temp. °C: 32
Access: MAYO RD Water Temp. °C: 20

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	100
Avg. Wetted Width (m)	1	Total Riffle (%)	
Total Length (m)	150	Total Run (%)	
Total Wetted Area (m^2)	150	Total Glide (%)	
Ave. Slope (%)	1.0	Total Slough (%)	
Debris (%)	2	Turbidity (cm)	VIS
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	5
Cobbles	2
Boulders	2
Bedrock	0

Comments:

Compaction NIL (L) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	INT POOLS IN LOWER 70 M
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile: Longitudinal

Comments:

UPPER 80 M DRY EARLY BUT LOWER 70 ARE PERMANENT AS LONG AS MAINSTEM FLOWS ARE ABOVE 5 CMS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 75F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/3/87		1.92	130	6	900	900
25/4/87 lower 70m	35	.015		3	450	
15/5/87 "	30	.011		2	300	
27/5/87	19	.0048		2	300	
29/7/87	?	.0048		1	300	
6/8/87	4.48	INT		1	150	

FISH UTILIZATION

supports coho and chum spawning; heavy chum spawning in high escapement years chum fry salvage usually necessary; 40,000 were rescued on April 25, 1987

ENHANCEMENT ASSESSMENT

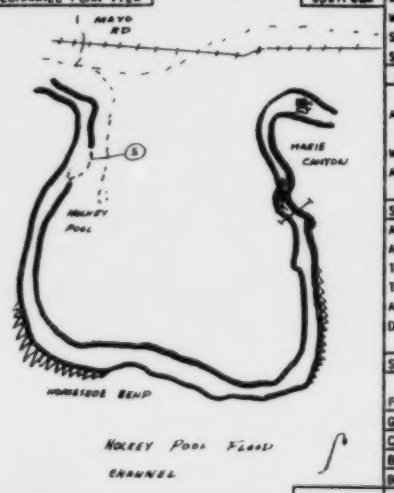
It may be possible to increase the height of the inlet berm and excavate an infiltration pool below it to reduce high flows (peak flows are about 50 percent too high) and increase summer flow

Wetted area increase - 150 m^2

Yield est - 240 to 300 fish

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 76F NTS Map: 92 B/13
Site Location: NEAR ZALEST
87 | 9 | 26 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 015, 016 photo nos.
Weather: CLEAR, MILD Air Temp. °C: 15
Access: MAYO RD, W RIVERSIDE RD Water Temp. °C: 9°

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	130	Total Run (%)	
Total Wetted Area (m^2)	34	Total Glide (%)	
Ave. Slope (%)	1.0	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	3
Cobbles	3
Boulders	3
Bedrock	0

Comments:

downstream

Compaction Hil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	DRY EXCEPT THREE POOLS
Mainstem Discharge (m^3/sec)	10

Gradient Profile: Longitudinal

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 76F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
16/3/87		3.2	130	10	1300	1300
25/4/87	20	0			34	
9/8/87	4.49	0			0	

FISH UTILIZATION

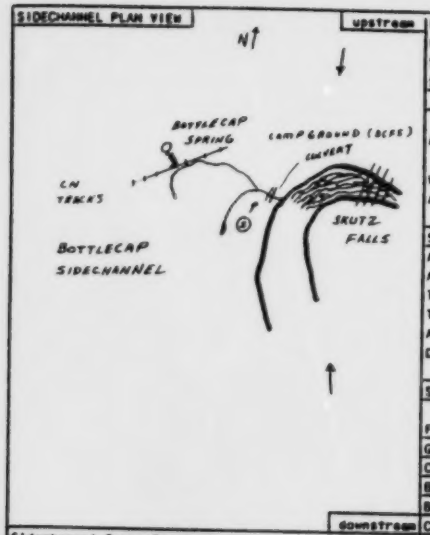
some coho and chum spawning in some years. Considerable early coho fry rearing in the lower 50 m which is a backwater in the spring. Approximately 200 to 400 smolts trapped. Salvage is difficult because of the boulder substrate.

ENHANCEMENT ASSESSMENT

No opportunities evident.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name COWICHAN

Watershed Code

Sidechannel No. 77R NTS Map: 92 B/13

Site Location 5m BELOW CULVERT ON COWICHAN FOOTPATH

77 | 6 | 27 Time 1300 Agency Crew TB

yr mo day

Air Photo Location No. BC 404 flight line 086, 087 photo nos.

Weather CLEAR, WARM Air Temp. °C 20.5

Access COWICHAN FOOTPATH Water Temp. °C 13 AT OUTLET, FROM SKUTZ FALLS 9 AT SOURCE

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	3	Total Pool (%)	30
Avg. Wetted Width (m)	.5	Total Riffle (%)	10
Total Length (m)	236	Total Run (%)	
Total Wetted Area (m^2)	118	Total Glide (%)	20
Ave. Slope (%)	.001	Total Slough (%)	40
Debris (%)	30	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M(H)

downstream

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.5
Wetted Width (m)	.5
Avg. Depth (cm)	.03
Wetted X-Sec Area (m^2)	.015
Avg. Velocity (m/sec)	.1
Flow (m^3/sec)	.0015 (.053 CFS)
Mainstem Discharge (m^3/sec)	18

Gradient Profile: Longitudinal)

Comments:

CULVERT AT 15.4 PREVENTS ACCESS GOOD POSSIBILITY OF LONG OVERWINTERING IF IT WERE REPLACED (A 1M ARCH CULVERT WOULD DO THE JOB

BOTTLE CAP SPRING, THE CHANNEL'S MAIN SOURCE, FLOWS STEADY AT APPROXIMATELY .02 CMS BETWEEN 9 AND 10° SIDECHANNEL FLOW IS INDEPENDANT OF RIVER FLOW BUT IS NOT REFLECTIVE OF SOURCE DISCHARGE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 77R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
23/10/86	4	.00081	236	.5	118	705
11/5/87	29	.0033		.6	142	
27/5/87	19	.0004		.2	47	
27/6/87	18	.0015		.5	118	
2/9/87	7	.0008		.5	118	
5/4/87	44	.0891		.7	165	
15/2/88	76	.019		1		

FISH UTILIZATION

None

ENHANCEMENT ASSESSMENT

Replacement of a culvert underneath the Cowichan Footpath (15 m from the river) would allow entry of coho fry for overwintering. A 1m diameter arch culvert set flush with the stream would do the job. The channel is excellent winter habitat - little flow fluctuation and 9° water. Fish may have trouble finding it however because of its size and adjacent river velocity (yield est. 705 coho smolts)

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream

downstream

Watershed Name	COWICHAN
Watershed Code	
Sidechannel No.	78A
NTS Map:	92 B/13
Site Location	20 m FROM MAINSTEM
87 | 6 | 27 (yr mo day) Time	Agency	Crew: TB
Air Photo Location No.	BC 404 (flight line)	056, 057 (photo nos.)
Weather	CLEAR, WARM	Air Temp. °C: 21
Access	ERVIE FALLS - HOLT CR. RD. BRANCH, PATH	Water Temp. °C: —

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	3	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	180	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	100
Debris (%)	10	Turbidity (cm)	
		Total	100%

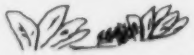
SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	1
Cobbles	0
Boulders	0
Bedrock	0

Comments:

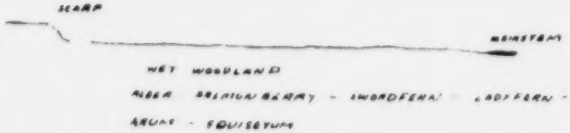
Compaction Hill L M (H)

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	DRY
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)



Comments:

FLOWS FROM NOVEMBER TO APRIL-MAY, INDEPENDENT FROM RIVER. COHO FRY HAVE BEEN OBSERVED IN WINTER

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 78A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
11/3/86	20	0	500	0	0	1500
4/25/87	35	.0007		1	500	

FISH UTILIZATION

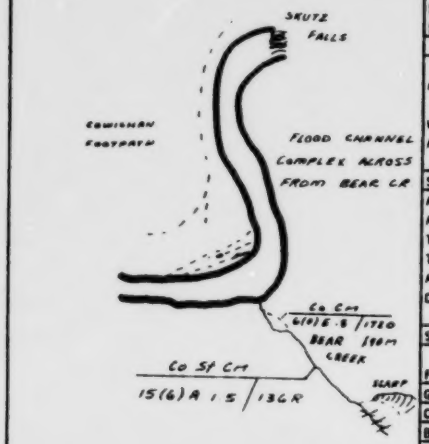
a few COHO fry have been observed in late winter. The channel is excellent winter habitat.

ENHANCEMENT ASSESSMENT

No major opportunities for improvement. The channel is rectified by periodic upland seepage and the winter water table.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 77F NTS Map: 92 B/13
Site Location:
17 | 6 | 27 Time: 1600 Agency: Crew: TB
yr mo day
Air Photo Location No.: BC 409 flight line: 056, 057 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 32
Access: FOOTPATH FROM Water Temp. °C: 16
UPPER CAMPGROUND AT SKUTZ FALLS

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool ($)	30
Avg. Wetted Width (m)	0	Total Riffle ($)	30
Total Length (m)	265	Total Run ($)	
Total Wetted Area (m^2)	242	Total Glide ($)	10
Ave. Slope ($)	.5	Total Slough ($)	10
Debris ($)	10	Turbidity (cm)	NIL
		Total	100$

SUBSTRATE COMPOSITION

	$
Fines	3
Gravel	7
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction NIL (L) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.3
Wetted Width (m)	.5
Avg. Depth (cm)	.03
Wetted X-Sec Area (m^2)	.007
Avg. Velocity (m/sec)	.26
Flow (m^3/sec)	.0019 (.067 CFS)
Mainstem Discharge (m^3/sec)	19

Gradient Profile: Longitudinal)

Comments:

A FLOODCHANNEL COMPLEX FEATURING THREE CHANNELS. THE TWO INNER MOST ARE ONLY COMPLETELY WETTED IN FLOODS BUT THE WINTER WATER TABLE WETS THEIR LOWER ENDS. THE OUTER CHANNEL CARRIES FLOW FROM NOVEMBER THROUGH JULY OR EARLY AUGUST

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 77F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
11/5/87	29	.0032	265		510	1390
21/5/87	19	.0021			510	
27/6/87	18	.0019			242	
3/9/87	7.48	0			0	

FISH UTILIZATION

A FEW COHO SPAWN IN THE OUTER CHANNEL AND SOME MAINSTEM FRY ENTER IT IN THE SPRING. ABOUT 500 COHO FRY BECOME TRAPPED BY MID - JULY

ENHANCEMENT ASSESSMENT

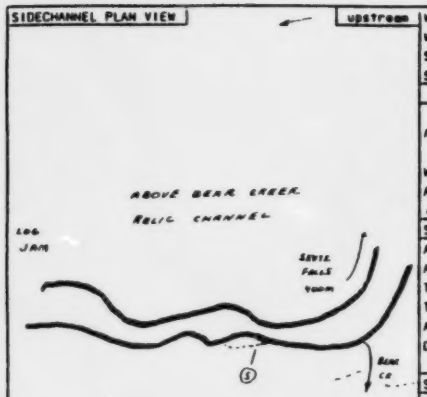
EXCAVATION OF A DEEP INFILTRATION POOL NEAR THE HEAD OF THE CHANNEL MIGHT PROVIDE CONTINUOUS SUMMER REARING. FRY SALVAGE IS NOT PRACTICAL BECAUSE OF NUMBERS AVAILABLE AND ACCESS AND CATCHABILITY DIFFICULTIES.

Wetted area increase = 510 m^2

Yield est = 50$ @ smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: BOR NTS Map: 92 B/13
Site Location: NEAR OUTLET
87 | 5 | 13 | Time: | Agency: | Crew: TB
yr mo day
Air Photo Location No.: BCC 409 flight line 036, 037 photo nos.
Weather: CLOUDY, LIGHT RAIN Air Temp. °C: 17
Access: MAYO RD, HOLT CR Water Temp. °C: 9
RD (BCFS); OLD GRADE; WARD BEAR CR; OLD GRADE, OVERGROWN

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	140	Total Run (%)	
Total Wetted Area (m^2)	1	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	40	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	1
Cobbles	0
Boulders	0
Bedrock	0

Comments: MUCH OF THE SUBSTATE IS SILT AND CLAY

Compaction: Nil L M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	DRY EXCEPT FOR ONE POOL
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY

1. WINTER WATER TABLE
2. SEEPAGE FROM THE UPLAND IN WINTER AND SPRING
3. VERY OCCASIONAL BANK OVERTOPPING FROM THE RIVER

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. BOR Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
13/5/87	30	0	140(1)	1	1	1400
26/5/87	19.5	0		0	0	

FISH UTILIZATION

Coho water in this channel and a few early fry enter it to rear. Coho smolts leave before it dries out. 100 - 500 fry are trapped.

I didn't survey this channel in early spring because its presence was unknown before May, 1987

ENHANCEMENT ASSESSMENT

Excavation of a deep infiltration pool near the inlet could improve rearing capability; summer and winter.

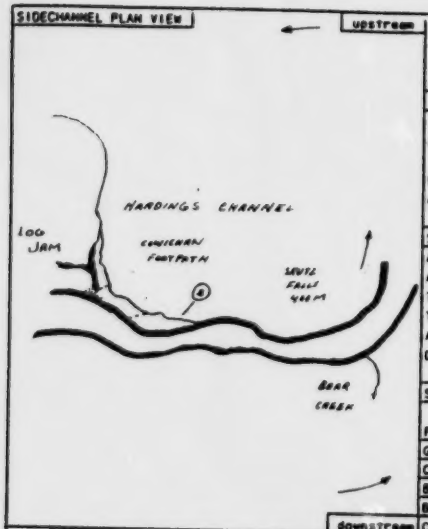
This channel is relatively inaccessible for heavy equipment

Wetted area increase = 1400 m^2

Yield 80? = 448 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 81A NTS Map: 92 B/13
Site Location: 70m ABOVE OUTLET
97 | 9 | 18 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 flight line 086, 087 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 30
Access: COWICHAN FOOTPATH FROM SHUTZ FALLS Water Temp. °C: 19 *
* POCKETS OF 11° GROUNDWATER

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	9	Total Pool (%)	55
Avg. Wetted Width (m)	7.5	Total Riffle (%)	13
Total Length (m)	410	Total Run (%)	0
Total Wetted Area (m^2)	3075	Total Glide (%)	6
Ave. Slope (%)	0.1	Total Slough (%)	26
Debris (%)	15	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	7
Cobbles	1
Boulders	0
Bedrock	0

Comments:

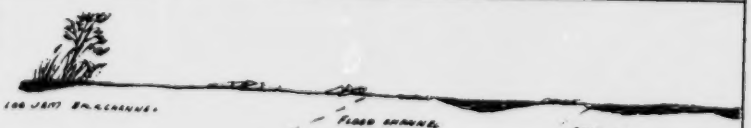
Compaction NIL (L) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	1.1
Wetted Width (m)	1.1
Avg. Depth (cm) m	.03
Wetted X-Sec Area (m^2)	.033
Avg. Velocity (m/sec)	.375
Flow (m^3/sec)	.00726 (.256 CFS)
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile: Longitudinal)



Comments:

MAIN CHANNEL BRANCHES OFF THE LOG JAM BACKCHANNEL. ITS STABLE AND OF VERY LOW GRADIENT. A FLOOD CHANNEL FROM THE LOWER LOG JAM BACKCHANNEL CONTRIBUTES WINTER - SPRING FLOW AS DOES A BREAKOUT CHANNEL 150 M DOWNSTREAM

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 81A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
11/5/97	29	.768	410	9	3690	3690
27/5/97	19.5	.035		8.5	3485	
3/8/97	9.49	.00726		7.5	3075	
3/9/97	7.0	.011		8.0	3280	

FISH UTILIZATION

Coho spawn and summer rear in this channel. Winter capability is moderate to high.

Note: large numbers of coho in high escapement years.

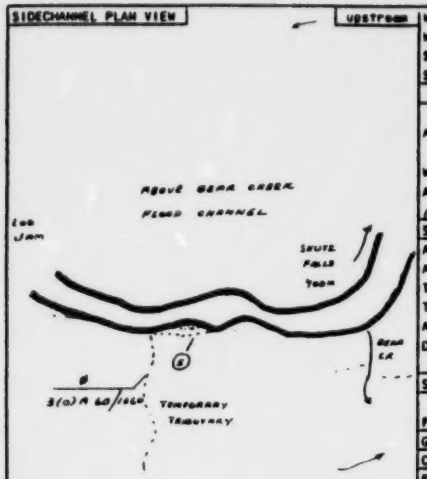
Chums also utilize this channel, particularly in years of heavy escapement.

ENHANCEMENT ASSESSMENT

No improvement required.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN

Watershed Code:

Sidechannel No. 82F NTS Map: 92 G/13

Site Location:

87 | 5 | 26 Time: ____ Agency: ____ Crew: TB

yr mo day

Air Photo Location No. BCC 484 086, 087

flight line photo nos.

Weather: CLOUDY, DRIZZLE Air Temp. °C: 17

Access: MOTORED ROUGH 20 (BCE), OLD GRADE, WADE BRACH, OLD GRADE, BUSHWACK Water Temp. °C: 9

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool ($)	100	
Avg. Wetted Width (m)	.61	Total Riffle ($)		
Total Length (m)	215	Total Run ($)		
Total Wetted Area (m^2)	14	Total Glide ($)		
Ave. Slope ($)	.2	Total Slough ($)		
Debris ($)	5	Turbidity (cm)		N/C
		Total		100$

SUBSTRATE COMPOSITION

	$	Comments:
Fines	2	
Gravel	8	
Cobbles	0	
Boulders	0	
Bedrock	0	

Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	DRY EXCEPT FOR 3 POOLS
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 82F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
13/3/87	30	.26	215	9	1935	2150
26/3/87	20	0		.01	24	
8/8/87	4.45	0		0	6	

FISH UTILIZATION

Coho spawn in this channel and spring fry attempt to rear. Peak flow velocities are too high for wintering coho.

Chum also spawn here, especially in big years like 1985 and 1987.

ENHANCEMENT ASSESSMENT

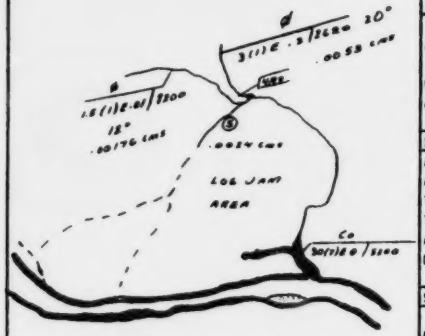
If the inlet berm could be raised and an infiltration pool could be excavated near the inlet, summer and winter rearing values would be improved.

Wetted area increase = 2150 m^2

Yield pot = 685 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 93A NTS Map: 92 B/13
Site Location:
87 / 9 / 17 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCA 404 flight line 027, 028 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 20
Access: COWICHAN RIVER/CREEK Water Temp. °C: 9.5

SIDECHANNEL SUMMARY (applies to active portion only)

Avg. Chan. Width (m)	5	Total Pool (%)	69
Avg. Wetted Width (m)	4	Total Riffle (%)	31
Total Length (m)	500	Total Run (%)	
Total Wetted Area (m^2)	2000	Total Glide (%)	1
Ave. Slope (%)	01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	N/A
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

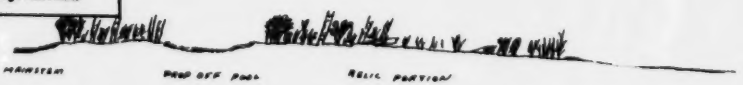
Compaction Nil (1) N H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.48
Wetted Width (m)	.45
Avg. Depth (cm)	.055
Wetted X-Sec Area (m^2)	.039
Avg. Velocity (m/sec)	.07
Flow (m^3/sec)	.0024 cms + .0076 + .0053
Mainstem Discharge (m^3/sec)	= .0099 ?

Gradient Profile:
Longitudinal



Comments:

A VERY COMPLEX CHANNEL SYSTEM. PRIOR TO THE MID 1960's, A PORTION OF THE RIVER WAS SAID TO FLOW THROUGH THE JAM AREA PROVIDING EXCELLENT REARING AND OVERWINTERING HABITAT FOR COHO AND RESIDENT TROUT JUVENILES. THE LOG JAM AREA IS NOW SELDOM WETTED EVEN DURING HIGH MAINSTEM FLOWS. IT HAS A PERIMETER CHANNEL SYSTEM (DOCUMENTED HERE) THAT IS ALMOST TOTALLY INDEPENDENT OF RIVER FLOW AND A LAGOON WETTED BY THE PERIMETER STREAM AND BACKFLOODING OF THE MAINSTEM.

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 93A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
25/9/86	9	.01	500	4	2000	2500
11/5/87	29	.035	500	4	2000	
12/8/87	7	.0094	500	4	2000	
8/10/87	4.41	.0091	500	4	2000	

FISH UTILIZATION

coho use mainstem for summer rearing and overwintering. cutthroat etc. also present

ENHANCEMENT ASSESSMENT

The upper 400m is now relic but could be rebuilt from the Drop Off Pool Flood Channel by breaching the 0.5 M berm that separates them and excavating a deep habitation pool just below creating a minimum wetted width of 4 M, 3600 m^2 of additional habitat might be produced.

Yield potential = 1,800 (1.0) coho fry
= 1152 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 84F NTS Map: 92 B/12
Site Location: 60 M ABOVE OUTLET
87 / 5 / 13 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 (flight line) 056, 057 (photo nos.)
Weather: CLOUDY; LIGHT RAIN Air Temp. °C: 17
Access: MAINLINE, BEAR MILL CR. Water Temp. °C: 9
RD, OLD BEAR CR. GRADE, WARD CR, OLD GRADE, BUTTONBRUSH

SIDECHANNEL, SUMMARY	BC	FC		BC	FC
Avg. Chan. Width (m)	1	3	Total Pool (%)		
Avg. Wetted Width (m)	7	0	Total Riffle (%)		
Total Length (m)	60	50	Total Run (%)		
Total Wetted Area (m^2)	420	0	Total Glide (%)		
Ave. Slope (%)	.001	.1	Total Slough (%)	100	
Debris (%)	5	5	Turbidity (cm)	NIL	
			Total	100%	

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	2
Cobbles	0
Boulders	6
Bedrock	0

Comments: BOTH REACHES

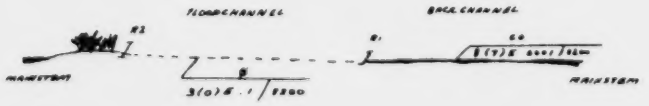
downstream

Compaction: Nil L M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	0
Mainstem Discharge (m^3/sec)	30

Gradient Profile: Longitudinal)



Comments: THIS CHANNEL IS OFTEN WETTED BY HIGH MAINSTEM FLOW BUT VELOCITY IS USUALLY LOW

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 84F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m) BC	Total Length (m) FC	Average Wetted Width (m^2)		Total Wetted Area (m^2)		Optimum	
13 / 5 / 87	30	0	60	30	7	0	420	0	420	150
26 / 5 / 87	19.5	0			0	0	0	0		

FISH UTILIZATION

A few coho fry enter the backchannel portion of the channel in the spring; 17 were counted on May 13, 1987. Some may also winter in the channel.

ENHANCEMENT ASSESSMENT

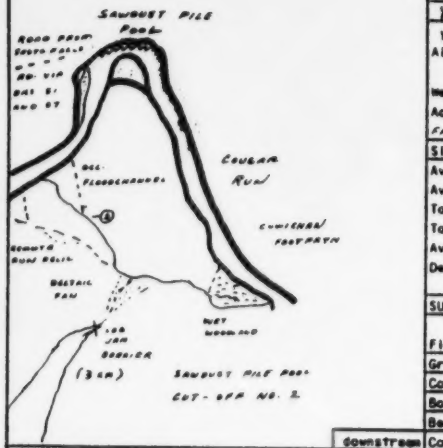
Excavation of an infiltration pool near the inlet could provide summer flow throughout the channel.

Wetted area increase = 630 m^2

Yield pot. = 20 CO SMOLTS

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 85A NTS Map: 92 B/13
Site Location: 100 M BELOW INLET
87 | 8 | 5 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 087, 088 photo nos.
Weather: CLEAR; WARM Air Temp. °C: 31
Access: GRAVEL RD FROM SOUTH FORKS RD, WARE RIVER, DUNCAN Water Temp. °C: 18.5

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	11	Total Pool (%)	48
Avg. Wetted Width (m)	5	Total Riffle (%)	34
Total Length (m)	647	Total Run (%)	
Total Wetted Area (m^2)	3235	Total Glide (%)	18
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	6
Cobbles	1
Boulders	1
Bedrock	0

Comments: FINES DECREASE UPSTREAM, PARTICULARLY ABOVE 230 M, AN UNSTABLE TRIBUTARY ENTERS AT THIS POINT.

downstream

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	3.5
Wetted Width (m)	2.8
Avg. Depth (cm)	.09
Wetted X-Sec Area (m^2)	.252
Avg. Velocity (m/sec)	.24
Flow (m^3/sec)	.0497 cms = 1.75 CFS
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

A MAJOR SIDECHANNEL. THE LOWER 230 M ARE INFLUENCED BY A TRIBUTARY WHICH PROVIDES GRAVEL AND COOL WATER

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 85A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
25/9/86	9.0	.032	647	6	3882	7117
13/5/87	30.0	1.94		9	5823	
28/5/87	23.0	.48		9	5823	
5/8/87	19	.065		6	3882	
5/8/87	9.48	.049		5	3235	

FISH UTILIZATION

This channel supports coho and steelhead spawning. It carries numerous coho fry (≈ 3/M^2) over the summer and may sustain them more through winter. A few cutthroat fry are also present in the summer and brown trout fry have been reported (Burns, 1987).

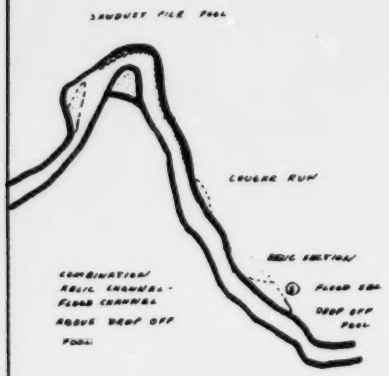
Large numbers of chum salmon utilize the channel in big years.

ENHANCEMENT ASSESSMENT

No improvement is required and it's doubtful any is feasible – a meander cut-off channel subject to high winter velocities. However, it's possible the river could take this course and strengthening the berm may be prudent. Two other possible breakout points are present nearby (see plan view). ≈ 100 M^2 of habitat would be lost if the Cowichan took a short cut here.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: GEMISCAM
Watershed Code:
Sidechannel No.: 86F NTS Map: 92 B/13
Site Location: CENTRE
87 | 5 | 11 | Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line; 087, 088 photo nos.
Weather: RAIN Air Temp. °C: 15
Access: GEMISCAM FOOTPATH Water Temp. °C: 15

SIDECHANNEL, SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	46
Avg. Wetted Width (m)	3	Total Riffle (%)	42
Total Length (m)	190	Total Run (%)	
Total Wetted Area (m^2)	570	Total Glide (%)	12
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	N/A
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	4
Gravel	5
Cobbles	1
Boulders	0
Bedrock	0

Comments:

downstream: Compaction Hill (1) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.6
Wetted Width (m)	.5
Avg. Depth (cm)	.03
Wetted X-Sec Area (m^2)	.015
Avg. Velocity (m/sec)	.33
Flow (m^3/sec)	.004 (.14 cfs)
Mainstem Discharge (m^3/sec)	.24

Gradient Profile: Longitudinal)

Comments:

RELIC SEGMENT IS 150 M
6(0)E 01 8200

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 86F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
23/4/87	35	.04	190	5	950	1140
11/5/87	29	.004	190	3	570	
2/7/87	17	0	70	1	250	
17/8/87	7	0	30	4	120	

FISH UTILIZATION

Coho fry enter this channel in the spring and there is some coho spawning in most years almost all fry leave before the channel dries. Why fry are able to exit some channels before drying while others are trapped in similar situations, is a mystery.

Adults use this channel on their escapement years. 189 carcasses were counted in Jan, 1988. They were so thick in places that growths of the filamentous oscillarian Sphaerotilus were present

ENHANCEMENT ASSESSMENT

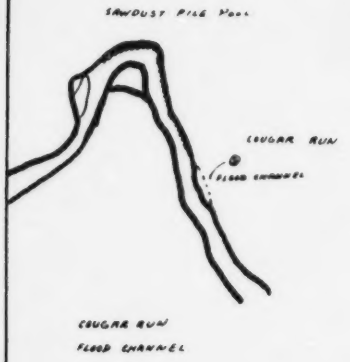
Permanent wetting might be provided by excavating an infiltration pool at the head of the relic section. Assuming a minimum wetted width of 2M, 680 m^2 of additional habitat would result.

Wetted area increase = 680 + 1020 (1.5 × 120) = 1700

Yield est = 544 to 3740 #'s

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 87F NTS Map: 92B/13
Site Location: CENTRE
87 | 5 | 11 | Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC409 087, 088
flight line photo nos.
Weather: CLOUDY, RAIN Air Temp. °C: 15
Access: COWICHAN FOOTBRIDGE Water Temp. °C: 15

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	3	Total Pool (%)	47
Avg. Wetted Width (m)	2	Total Riffle (%)	50
Total Length (m)	40	Total Run (%)	
Total Wetted Area (m^2)	120	Total Glide (%)	3
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	5
Cobbles	2
Boulders	1
Bedrock	0

Comments:

Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	3
Wetted Width (m)	3
Avg. Depth (cm)	.06
Wetted X-Sec Area (m^2)	.03
Avg. Velocity (m/sec)	.5
Flow (m^3/sec)	.012 (.42 CFS)
Mainstem Discharge (m^3/sec)	29

Gradient Profile:
Longitudinal

Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 87F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
11/5/87	29	.012	120	2	240	360
5/6/87	20	.009	60	1	60	
17/8/87	7	.002	40	1	40	

FISH UTILIZATION

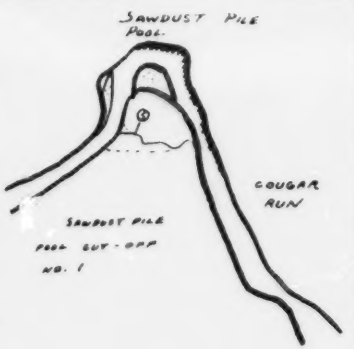
a few (< 50) coho fry enter mainstream in the spring

ENHANCEMENT ASSESSMENT

no improvement necessary

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name COWICHAN

Watershed Code

Sidechannel No. 88A NTS Map: 92 B/13

Site Location 30 M BELOW INLET

87 | 9 | 19 Time Agency Crew

yr mo day

Air Photo Location No. BCC 404 flight line 087, 088 photo nos.

Weather CLEAR, HOT Air Temp. °C 32

Access ON 81 ACCESS RD FROM Water Temp. °C 20

SKUTZ FALLS RD., WADE OR BOAT RIVER, SWIMMABLE

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	35
Avg. Wetted Width (m)	5	Total Riffle (%)	37
Total Length (m)	120	Total Run (%)	
Total Wetted Area (m^2)	600	Total Glide (%)	28
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	1	
Gravel	7	
Cobbles	1	
Boulders	1	
Bedrock	0	

downstream Compaction NIL (L) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	2.3
Wetted Width (m)	2.3
Avg. Depth (cm)	.07
Wetted X-Sec Area (m^2)	.161
Avg. Velocity (m/sec)	.65
Flow (m^3/sec)	.0937 CMS = 2.95 CFS
Mainstem Discharge (m^3/sec)	4.49

Gradient Profile: Longitudinal)

Comments:

A MEANDER CUT-OFF CHANNEL. INLET BERM IS SUBJECT TO CONSIDERABLE WINTER FORCE.

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 88A Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
25/9/86	9.0	.2	120	7	840	1200
13/5/87	30.0	1.19		10	1200	
23/5/87	22.0	.72		9	1080	
5/8/87	7	.17		7	840	
7/8/87	4.48	.083		5	600	

FISH UTILIZATION

COHO spawning and summer rearing

Steelhead summer rearing

The channels winter cabability is believed to be nil because of high flows. This is a cut-off channel with winter velocities higher than the mainstem.

Brown trout fry have been reported from the channel (Burns, 1987)

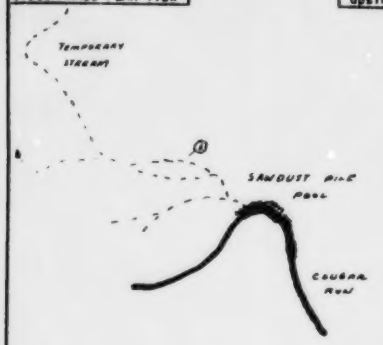
Large numbers of chums in some years

ENHANCEMENT ASSESSMENT

Strengthening the inlet berm might reduce winter flows and increase winter habitability for coho and steelhead

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 89A NTS Map: 92 B/13
Site Location: 100M ABOVE OUTLET
96 | 9 | 25 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BC 91009 flight line 057, 059 photo nos.
Weather: NA Air Temp. °C: NA
Access: FROM SELVE FALLS RD TO AR 61 AND AR 59 Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	NA
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	1760 (500)	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

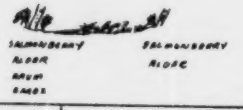
SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	1
Cobbles	0
Boulders	0
Bedrock	0

Comments:

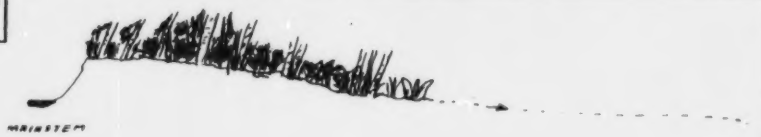
downstream: Compaction Hill Rd

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary	NA
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)



Comments:

AN OLD POST - GLACIAL CHANNEL COMPLEX WELL REMOVED FROM THE PRESENT RIVER REGIME EXCEPT IN THE LOWER 500M WHERE THE WINTER WATER TABLE PROVIDES SPORADIC WETTING AND INTERMITTENT FLOW

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 89A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/2/97		.073	500	1	500	25900
15/4/97		0				

FISH UTILIZATION

None There is excellent coho winter habitat in the lower portion of this complex but it isn't wetted until late winter and a steep riffle at the confluence prevents coho pig from entering

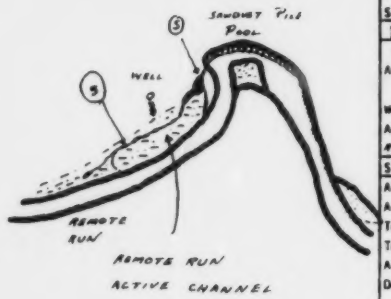
ENHANCEMENT ASSESSMENT

There are no improvement opportunities evident at this point A number of small wetland basins are located in the headwater zone of a temporary tributary. These impoundment might provide perennial flow in the tributary and about 500 m of the sidechannel. Detailed assessment is required. However

It may also be possible to wet the lower 500m by excavation of 90A

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 90A NTS Map: 92 B/13
Site Location: UPPER (88 m BELOW INLET) LOWER (OUTLET)
17 | 9 | 86 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BC 1009 flight line 057, 058 photo nos.
Weather: CLEAR; WARM Air Temp. °C: 32
Access: BESI, BRST ROADS Water Temp. °C: 16.5
AP

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	75
Avg. Wetted Width (m)	5	Total Riffle (%)	20
Total Length (m)	360	Total Run (%)	
Total Wetted Area (m^2)	1800	Total Glide (%)	5
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	NIL
		Total	100%

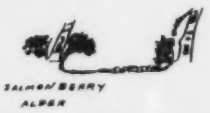
SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	6
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction NIL (L) M H

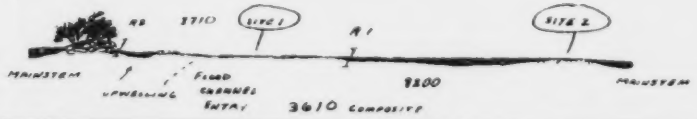
Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	2
Wetted Width (m)	2
Avg. Depth (cm)	.09
Wetted X-Sec Area (m^2)	.18
Avg. Velocity (m/sec)	05
Flow (m^3/sec)	.072
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile: Longitudinal)



Comments:

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 90A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
24/9/86	9.5	.3	360	5	1800	3600
30/2/87		2.0		10	3600	
23/5/87	24.0	.016		9	3240	
5/8/87	7	.147		5	1800	
3/9/87	4.48	.672		5	1800	
8/9/87	4.48	INT-.0602		5	1800	
17/9/87	7	.11		5	1800	

FISH UTILIZATION

Coho summer rearing and the probability of overwintering in reach 1. High probability of coho spawning. Chums also spawn in the channel.

ENHANCEMENT ASSESSMENT

High water flows limit habitability. Run a bypass channel near the inlet would be deemed to limit high flows. Expansion or modification pool could increase summer flow.

Wetted area increase = [illegible] m^2

Yield est = 5 % of 3110 YRS

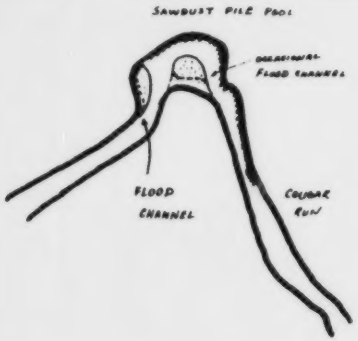
Excavation of high spot near also be necessary.

Upper site

Upper site so difficult to measure in low flows while the lower site is impossible to monitor in high flows

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 91F NTS Map: 92 B/13
Site Location
Date: 17 | 5 | 96 (yr mo day) Time: ____ Agency: ____ Crew: TB
Air Photo Location No.: BCC 404 (flight line) 087, 088 (photo nos.)
Weather: MOSTLY CLOUDY, COOL Air Temp. °C: 17
Access: FROM SCHOOL RAILROAD THRU GR 91 Water Temp. °C: 12

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	100
Avg. Wetted Width (m)	5	Total Riffle (%)	
Total Length (m)	60	Total Run (%)	
Total Wetted Area (m^2)	300	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	
Debris (%)	1	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

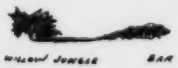
	%
Fines	1
Gravel	8
Cobbles	1
Boulders	0
Bedrock	0

Comments:

downstream

Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary	NA
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

ANOTHER CHANNEL IS SOMETIMES PRESENT ON THE POINT BAR AT THE TOP OF THE MEANDER. THE BAR CHANGES ANNUALLY SO THIS OCCASIONAL CHANNEL HAS NOT BEEN MAPPED. IN YEARS WHEN IT'S PRESENT, IT'S VERY TEMPORARY AND NOT A PRODUCTION FACTOR

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 91F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
30/5/96	50	.106	70	10	700	700
23/5/97	21	0	60	5	300	
9/8/97	9.48	0	38	2	76	
17/9/97	"	0	41	2	82	

FISH UTILIZATION

Coho fry are trapped in this channel - 100 to 300. In some years, water persists until autumn and about half survive. In other years, drying occurs by late July or August

ENHANCEMENT ASSESSMENT

No enhancement practical. Salvage is not seen a worthwhile option because of numbers and the difficulty of catching fry here. A willow jungle is present on the deep side of the channel and fish hide quickly

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream

Watershed Name COWICHAN
Watershed Code
Sidechannel No. 93R NTS Map: 92 B/13
Site Location 30 m BELOW UPPER BND
17 | 5 | 87 Time Agency Crew TB
yr mo day
Air Photo Location No. flight line photo nos.
Weather PARTLY CLOUDY, COOL Air Temp. °C 14
Access HIKE UP FROM ROAD Water Temp. °C NA
CR OR WADE / BOAT REACHES FROM BR 57 - RIVER ONLY WADEABLE (?)

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	NA
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	320	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	5	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	9	
Gravel	2	
Cobbles	0	
Boulders	0	
Bedrock	0	

downstream Comparison Hill L M(H)

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary	NA
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE AND OCCASIONAL BANK OVERTOPPING

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 93R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
3/4/87	44	0	320	0	0	3200

FISH UTILIZATION

none

ENHANCEMENT ASSESSMENT

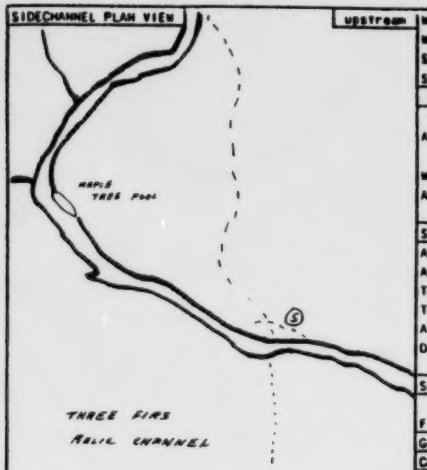
It might be advantageous to cut two channels via a buried pipe or culvert drain. At least 640 m^2 of coho summer rearing habitat would result but, more importantly, draining off some water here would remove some pressure from the two meander cut-off channels just downstream and lessen the chance of a major mainstem breakout.

Wetted area increase = 3200 m^2

Yield est = 10% of smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 93R NTS Map: 92B/12
Site Location: CENTRAL
87 | 4 | 2 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 089,090 photo nos.
Weather: Air Temp. °C:
Access: Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	100
Avg. Wetted Width (m)	4	Total Riffle (%)	
Total Length (m)	115 (40)	Total Run (%)	
Total Wetted Area (m^2)	160	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

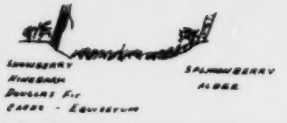
	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

Compaction Nil L M (H)

Sidechannel Cross-Section
(downstream view)

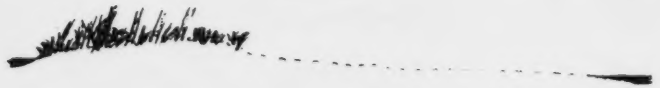


SNOWBERRY
RHODODEN
DOUGLAS FIR
CEDAR - EQUISETUM

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)



Comments:

WETTED BY THE WINTER WATERTABLE AND BACKFLOODING (40M)

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 93R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
4/2/87	44	0	115 (40)	4	160	690
1/5/87	30	0	30	3	90	
16/10/87		0	5	2	10	
2/9/87			7	3	21	

FISH UTILIZATION

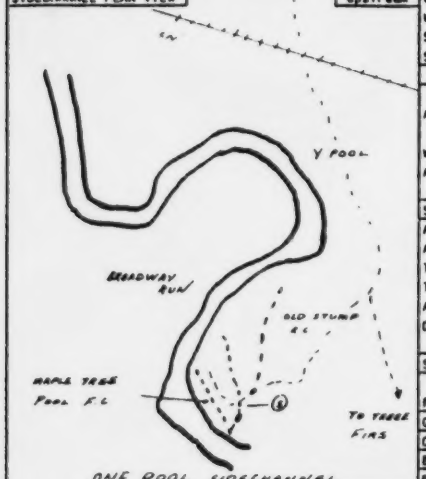
Chance of overwintering coho in lower 40m when in backchannel

ENHANCEMENT ASSESSMENT

No practical opportunities for improvement

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 94R NTS Map: 92B/13
Site Location: LOWER
87 | 9 | 9 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 flight line 019, 090 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 25
Access: SHUTZ FALLS RD. Water Temp. °C:
BAS RD

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	4	Total Pool (%)	100
Avg. Wetted Width (m)		Total Riffle (%)	
Total Length (m)	180	Total Run (%)	
Total Wetted Area (m^2)	9	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	6
Cobbles	1
Boulders	1
Bedrock	0

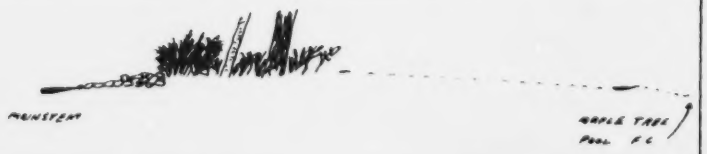
Comments:

Compaction NIL L (M) H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)



Comments:

CARRYS MINOR FLOW IN HIGH WATER MAIN

SOURCE OF WINTER WETTING IS WATER TABLE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 94R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/2/82	150	034	180	4	720	720
13/5/87	39 5	0		.097	70	
3/9/87	4 ~ 5	0		.012	9	

FISH UTILIZATION

a few coho fry enter from the Maple Tree Pool sidechannel in april most are lost to drying

ENHANCEMENT ASSESSMENT

excavation is possible but impractical

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

Watershed Name COWICHAN

Watershed Code

Sidechannel No. 94R NTS Map: 92 B/13

Site Location NEAR MEAD

87 | 9 | 8 Time ____ Agency ____ Crew TG
yr mo day

Air Photo Location No. BCC 404 flight line 019, 020 photo nos.

Weather CLEAR, WARM Air Temp. °C 35

Access ROUTE #1 RD, #2 S1 ROAD Water Temp. °C NA

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	20	Total Pool (%)	NA
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	395	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	
Debris (%)	5%	Turbidity (cm)	
		Total	100%

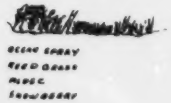
SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	1
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M H NA

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary NA

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal

Comments:

AN OLD LOGGING ROAD CHANNEL THAT IS NEVER WETTED. TRIBUTARY TO ONE MILE ROCK CHANNEL

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 94R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
2/9/87	79	0	395(0)	0	0	3960

FISH UTILIZATION

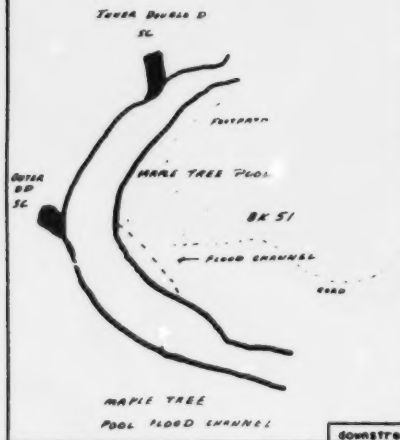
None

ENHANCEMENT ASSESSMENT

No enhancement is possible

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 95F NTS Map: 92 B/13
Site Location: 10 M DOWNSTREAM FROM HEAD
87 | 5 | 12 | Time: | Agency: | Crew: TB
yr mo day
Air Photo Location No.: BCC 404 — flight line: 039,090 — photo nos.
Weather: PARTLY CLOUDY Air Temp. °C:
Access: RR 51 ROSS MAIN ROUTE FALLS RD Water Temp. °C: 13

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	22	Total Pool (%)	10
Avg. Wetted Width (m)	9	Total Riffle (%)	80
Total Length (m)	100	Total Run (%)	
Total Wetted Area (m^2)	800	Total Glide (%)	10
Ave. Slope (%)	1.0	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	6
Cobbles	1
Boulders	1
Bedrock	0

Comments:

downstream

Compaction Nil (L) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	8
Wetted Width (m)	8
Avg. Depth (cm)	.08
Wetted X-Sec Area (m^2)	.64
Avg. Velocity (m/sec)	.30
Flow (m^3/sec)	.15 CMS (5.3 CFS)
Mainstem Discharge (m^3/sec)	29 S

Gradient Profile: Longitudinal)

Comments:

INUNDATED BY HIGH WINTER FLOWS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 95F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/3/82	150	INUNDATED	100	NA	2300	800
12/5/87	29 S	.15		8	800	
4/6/87	20	0		0	0	
1/7/87	19	0		0	0	

FISH UTILIZATION

Early coho fry are attracted in large numbers. An estimated 2400 were present on May 12, 1987. Unfortunately, I was not able to determine if they left before the channel dried. Because it dries from the upstream end, it's likely most escaped.

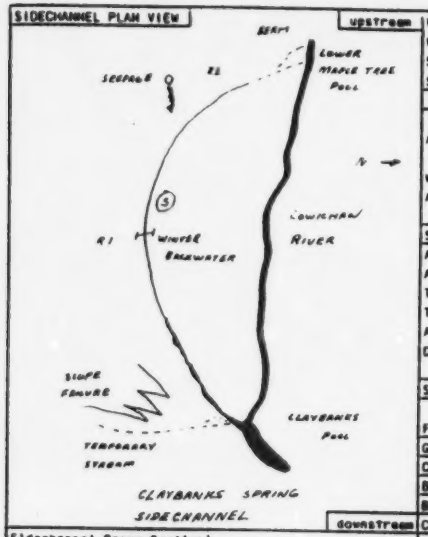
Early emergent steelhead fry also use this channel. Steelhead spawn within 10 m of the inlet.

ENHANCEMENT ASSESSMENT

No improvement necessary. The bar could be lowered to prolong summer flow but this would open the channel to the erosive effects of high winter discharge.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 96A NTS Map: 92 B/13
Site Location
17 | 6 | 14 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line: 089, 090 photo nos.
Weather: CLEAR Air Temp. °C: 17°
Access: BR 51 Water Temp. °C: 10°

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	4.5	Total Pool (%)	64
Avg. Wetted Width (m)	1.5	Total Riffle (%)	28
Total Length (m)	150	Total Run (%)	
Total Wetted Area (m^2)	225	Total Glide (%)	8
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

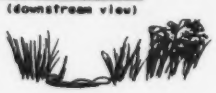
SUBSTRATE COMPOSITION

	%	
Fines	90	2
Gravel	4	3
Cobbles	0	5
Boulders	0	0
Bedrock	0	0

Comments:
TWO REACHES

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)



ELEV ± 143

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	1
Wetted Width (m)	.54
Avg. Depth (cm)	.05 (5)
Wetted X-Sec Area (m^2)	.027
Avg. Velocity (m/sec)	.18
Flow (m^3/sec)	.006 = .22 CFS
Mainstem Discharge (m^3/sec)	20.5

Gradient Profile: Longitudinal)

Comments:
TWO REACHES
1 G(1) E.1 6900 100 M BACKS UP IN WINTER. 80 % POOL, 20 % RIFFLE
2 B(1) E.5 2350 50 M SEEPS THRU BERM AND FILLS UP GROUNDWATER
SEEPAGE, SOME GENTLE WINTER OVERTOPPING OF MAINSTEM

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 96A

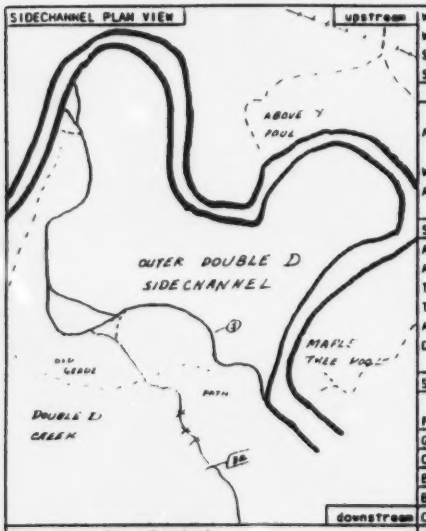
Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
4/6/87	20.5	.006	150	1.5	150	675
5/8/87	7	.007		1.5	150	
3/9/87	4.45	.0073		1.5	150	

FISH UTILIZATION
Coho summer rearing and wintering.

ENHANCEMENT ASSESSMENT
No improvement measured.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN

Watershed Code:

Sidechannel No.: 97A NTS Map: 92 B/13

Site Location: 150 m ABOVE OUTLET

97 | 8 | 27 Time: ____ Agency: ____ Crew: TB

yr mo day

Air Photo Location No.: BC 81009 flight line: 035, 036 photo nos.

Weather: CLEAR, HOT Air Temp. °C: 33

Access: SKUTZ FALLS RD, RR Water Temp. °C: 19.5

S: RD., WADE OR BOAT MAPLE TREE POOL

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	13	Total Pool (%)	31
Avg. Wetted Width (m)	10.5	Total Riffle (%)	38
Total Length (m)	1300	Total Run (%)	8
Total Wetted Area (m^2)	13650	Total Glide (%)	23
Ave. Slope (%)	.6	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	6
Cobbles	2
Boulders	1
Bedrock	0

Comments:

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	10.5
Wetted Width (m)	10.5
Avg. Depth (cm)	.29
Wetted X-Sec Area (m^2)	2.94
Avg. Velocity (m/sec)	.26
Flow (m^3/sec)	.62 (21.88 CFS)
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile:
Longitudinal)

Comments:

A MAJOR SIDECHANNEL. THE LONGEST IN LENGTH AND WETTED AREA

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 97A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
12/5/97	29.5	2.6	1300	13	16900	16900
4/6/97	30.5	1.98		11	14300	
1/7/97	19.0	.57		11	14300	
5/8/97	7.0	.99		11.6	15080	
8/8/97	4.47	.62		10.5	13650	

FISH UTILIZATION

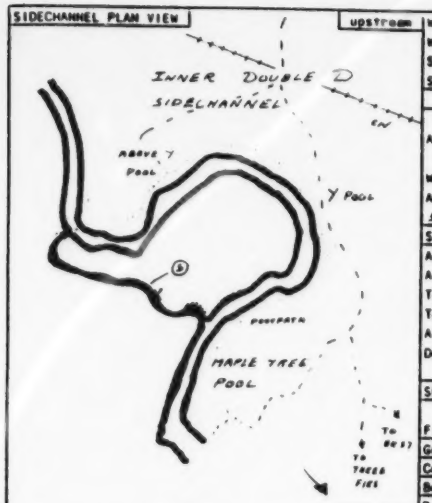
COHO, STEELHEAD, CUTTHROAT AND BROWN TROUT SPAWN, REAR AND WINTER IN THIS CHANNEL. LATE SUMMER COHO FRY DENSITY IS APPROXIMATELY 7/m^2 IN POOLS AND GLIDES.

ENHANCEMENT ASSESSMENT

NO ENHANCEMENT NECESSARY.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 98A NTS Map: 92 B/13
Site Location:
87 9 9 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 050, 051 photo nos.
Weather: CLEAR; HOT Air Temp. °C: 33
Access: HWY 8 MILE RD., BX Water Temp. °C: 20 5
S/AD, BOAT OR WADE COWICHAN

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	13	Total Pool (%)	32
Avg. Wetted Width (m)	7.6	Total Riffle (%)	33
Total Length (m)	397	Total Run (%)	20
Total Wetted Area (m^2)	3414	Total Glide (%)	15
Ave. Slope (%)	1.5	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	5
Cobbles	3
Boulders	1
Bedrock	0

Comments: CONSIDERABLE VERTICAL EROSION

downstream

Compaction NIL (L) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	9.6
Wetted Width (m)	9.6
Avg. Depth (cm)	.23
Wetted X-Sec Area (m^2)	1.978
Avg. Velocity (m/sec)	1
Flow (m^3/sec)	1.9834 (55.85 cfs)
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile: Longitudinal

Comments: THIS CHANNEL CARRYS MORE FLOW THAN ANY OTHER; BUT IT'S A HEAVY FLOW WITH DIFFICULT WADING EVEN AT MINIMUM DISCHARGE. RIFFLE AND RUN VELOCITIES RANGE FROM 1 - 3 M/SEC. POOLS ARE SHORT AND TURBULENT. INNER DOUBLE D IS A MEANDER CUT-OFF CHANNEL THAT WAS LIKELY STARTED BY A LOG JAM. IF ANOTHER WERE TO FORM BELOW ITS INLET (UNLIKELY), THE MAINSTEM COULD BE ISOLATED.

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 98A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
9/5/87	30	9.899	397	13	5161	5161
22/5/87	22	6.24	397	13	5161	
5/8/87	7	2.92	397	9.5	3772	
8/8/87	4.48	1.58	397	8.6	3414	

FISH UTILIZATION

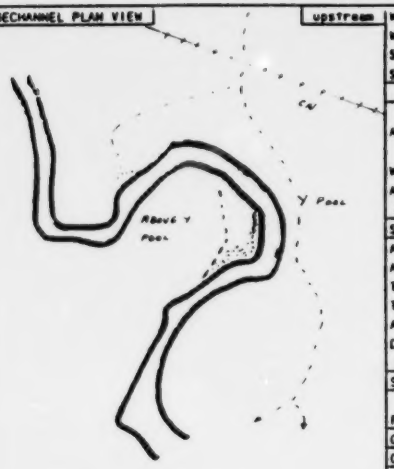
Supports coho and steelhead spawning and summer rearing; brown trout fry have also been reported (Burns, 1987). Production is limited by high velocities which restrict rearing to pools and glides and probably preclude overwintering.

ENHANCEMENT ASSESSMENT

No practical opportunities exist. It would be advantageous to create a strong berm at the inlet. This would be costly and difficult and might not yield high benefits in the short term. In the long term, it may prevent the meander from being completely cut-off and dewatered. The habitat value of the meander is much superior to that of the sidechannel.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 99A NTS Map: 92 B/13
Site Location: 115 m ABOVE OUTLET
17 | 9 | 87 Time: Agency: Crew: TG
yr mo day
Air Photo Location No.: BCC 409 050 ; 251
flight line photo nos.
Weather: CLEAR, WARM Air Temp. °C: 23
Access: TRANS CANADA HWY, DAVIS RD Water Temp. °C: 16.5
RD , WADE, BOAT OR SWIM COWICHAN AT Y POOL OR ABOVE Y POOL

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	4	Total Pool (%)	100
Avg. Wetted Width (m)	2.9	Total Riffle (%)	
Total Length (m)	112 m	Total Run (%)	
Total Wetted Area (m^2)	330	Total Glide (%)	
Ave. Slope (%)	2	Total Slough (%)	
Debris (%)	5	Turbidity (cm)	NIL
* FLOWS PARTIAL ONLY. ROAD 164 IS 99 x 10		Total	100%

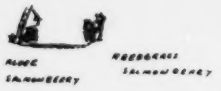
SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	6
Cobbles	1
Boulders	0
Bedrock	

Comments:

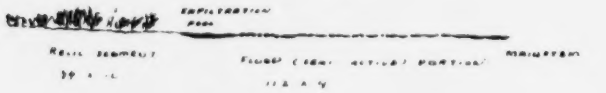
downstream Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	DRY EXCEPT FOR Y POOL IN THE LOWER 112 M
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal



Comments:

THE UPPER 84 M OF THIS SIDECHANNEL IS RELIC. FLOOD WATERS NEVER REACH IT. THE LOWER 112 M IS SEMI-ACTIVE, ACTIVED BY THE WINTER WATER TABLE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 99A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
12/5/87	30	0	112	.53	240	448
1/7/87		0		.40	130	
3/9/87	448	0		.29	130	
5/9/87		0		.29	130	

FISH UTILIZATION

COHO spawn in this channel, numbers are low. Some fry attempt to rear over the summer but most are lost due to drying. Approximately 800 emergent in the infiltration pool

ENHANCEMENT ASSESSMENT

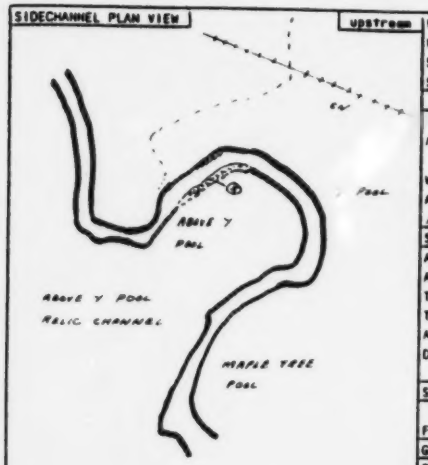
Excavation could provide permanent flow in the lower 112 m

Wetted area increase = 418 m^2

Yield est. = 101 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 100R NTS Map: 92 B/13
Site Location: 140 m ABOVE OUTLET
97 | 5 | 12 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 050, 051 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 17
Access: TRUCK ROAD TO 80, 85; 80 BOARDER RD TO ABOVE Y POOL; SWIM, BOAT OR WADE COWICHAN
Water Temp. °C: 12

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	7	Total Pool (%)	15
Avg. Wetted Width (m)	.51	Total Riffle (%)	
Total Length (m)	310	Total Run (%)	
Total Wetted Area (m^2)	620	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	82
Debris (%)	3	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	2
Cobbles	5
Boulders	1
Bedrock	0

Comments:

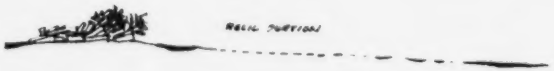
Compaction NIL L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	DAY SILENT 4 POOLS AND
Mainstem Discharge (m^3/sec)	30 & BACKWATER

Gradient Profile:
(Longitudinal)



Comments:

A RATHER COMPLEX CHANNEL. THE UPPER 70 M IS MAINLY RELIC WITH NO CLEARLY DEFINED CHANNEL. THREE SMALL FLOOD CHANNELS 1 - 3 M WIDE ARE PRESENT ON AN OLD FLOOD PLAIN ABOUT 50 M WIDE. THESE CONSOLIDATE 140 M ABOVE THE CONFLUENCE TO FORM AN INTERMITTENT SECTION 75 M LONG FOLLOWED BY A 30 M BACKWATER.

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 100R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
18/9/96	9	0	310	.26	412	1470
12/3/97	30	0		.51	756	
3/8/97	4.48	0		.29	412	
3/9/97	4.48	0		.29	412	

FISH UTILIZATION

a few coho fry enter this channel in April and rear over the summer. Only the top pool drew a 50 x 6 m backwater is present at the lower end and is responsible for most of the rearing.

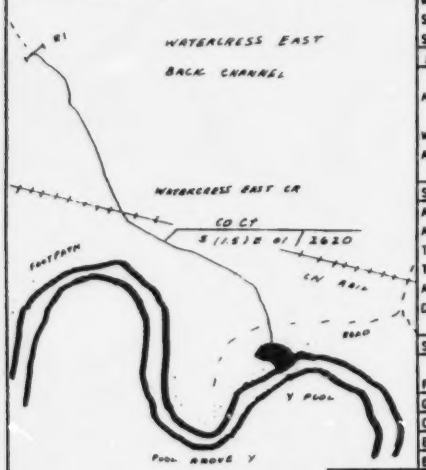
ENHANCEMENT ASSESSMENT

It would be possible to prolong flow by deepening or infiltration pool near the inlet and excavating the relict portion of the channel

Increase wetted area = 1053 m^2
Yield potential = 338 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 101 B NTS Map: 92 B/13
Site Location:
87 | 8 | 5 | Time: | Agency: | Crew: TB
yr mo day
Air Photo Location No.: BCC 404 031, 052
flight line photo nos.
Weather: CLEAR, WARM Air Temp. °C: 30
Access: SOUTH SHORE RD, BK Water Temp. °C: 16°
SI RD, COWICHAN FOOTPATH 135 IN CREEK, 25 IN RIVER

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	8	Total Riffle (%)	
Total Length (m)	100	Total Run (%)	
Total Wetted Area (m^2)	800	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	100
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments: CONSIDERABLE GRAVEL UNDERNEATH

downstream

Compaction Nil L M(H)

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.7
Wetted Width (m)	.7
Avg. Depth (cm)	05
Wetted X-Sec Area (m^2)	035
Avg. Velocity (m/sec)	.21
Flow (m^3/sec)	.0074 (.26 CFS)
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile: Longitudinal)

Comments: THIS CHANNEL IS FED BY WATERCRESS EAST CREEK, A COMPLEX GROUNDWATER SYSTEM THAT, IN PART, OCCUPIES A VERY OLD RELIC CHANNEL.

SIDE CHANNEL ASSESSMENT SUMMARY 1

Sidechannel No. 101B Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
10/4/85	40	.12	100	10	1000	1000
12/9/85	3	006		8	800	
9/3/87	30	.02		9	900	
8/8/87	4.48	0074		8	800	

FISH UTILIZATION

The channel may be utilized by cutthroat, coho and trout and is heavily utilized by coho fry in the spring and summer

ENHANCEMENT ASSESSMENT

No evident enhancement opportunities

1 FLOW CALCULATIONS ARE FOR WATERCRESS EAST CREEK

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

POOL ABOVE Y ACTIVE CHANNEL

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 102A NTS Map: 92 B/13
Site Location: CENTRAL
87 / 7 / 1 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 449 flight line 051, 052 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 30
Access: BIKE/ROAD WETHERS Water Temp. °C: 15.5
TRAIN FOOTPATH

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	66
Avg. Wetted Width (m)	2	Total Riffle (%)	44
Total Length (m)	160	Total Run (%)	
Total Wetted Area (m^2)	320	Total Glide (%)	
Ave. Slope (%)	0.8	Total Slough (%)	
Debris (%)	1	Turbidity (cm)	N/A
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	9
Cobbles	1
Boulders	1
Bedrock	0

Comments:

downstream

Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.7
Wetted Width (m)	.7
Avg. Depth (cm)	.09
Wetted X-Sec Area (m^2)	.09
Avg. Velocity (m/sec)	.43
Flow (m^3/sec)	.0056 (.197 CFS)
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal

Comments:

WINTER FLOWS ARE SUBSTANTIAL. THIS CHANNEL OPERATES LIKE A FLOOD CHANNEL AND WOULD BE CLASSED AS SUCH IF IT DRIED

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 102A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
7/2/84	50	1.44	160	6	960	960
9/3/87	30	.007		3	490	
1/7/87	19	.0056		2	320	
2/8/87	7	.0040		1.8	288	
3/8/87	4.48	.0040		1.8	288	

FISH UTILIZATION

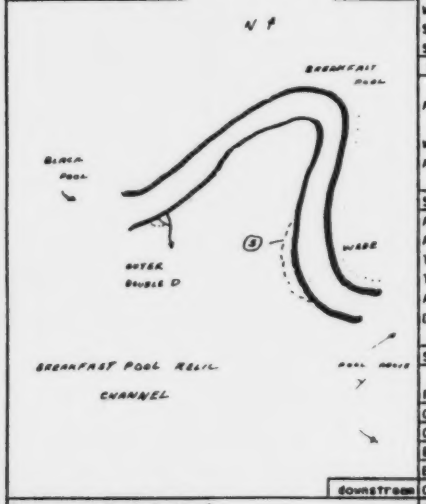
This channel supports coho spawning in its lower 50m. Some 300 coho fry rear in it over the summer. Its winter carrying capacity is judged to be nil due to variable high flows and lack of cover. The channel is almost straight with no undercut banks, deep pools, log jams, etc. Winter flow velocities often exceed 1 m/sec.

ENHANCEMENT ASSESSMENT

There is no opportunity for enhancement. More summer water would be beneficial but it's doubtful if it could be provided without increasing winter flow. The channel could be eliminated by a large flood.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 103R NTS Map: 92 B/13
Site Location:
87 | 7 | / | Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 94V 051, 052
flight line photo nos.
Weather: CLEAR, WARM Air Temp. °C: 24
Access: WADE RIVER JUST ABOVE MYSTERY CREEK Water Temp. °C: NA

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool ($)		NA
Avg. Wetted Width (m)	0	Total Riffle ($)		
Total Length (m)	120	Total Run ($)		
Total Wetted Area (m^2)	0*	Total Glide ($)		
Ave. Slope ($)	.01	Total Slough ($)		
Debris ($)	NA	Turbidity (cm)		
* WIDELY SCATTERED POTHOLES		Total		100$

SUBSTRATE COMPOSITION

	$
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary	
Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	0
Mainstem Discharge (m^3/sec)	19

Gradient Profile:
Longitudinal)

Comments:

WETTED SPORADICALLY BY WINTER WATER TABLE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 103R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
4/4/87	39	0	120	0	1	720
12/5/87	30	0		0	1	
1/7/87	19	0		0	2	

FISH UTILIZATION

None.

ENHANCEMENT ASSESSMENT

Excavation of a deep infil- ration pool near the outlet could provide summer flow additional downstream excavation may be required

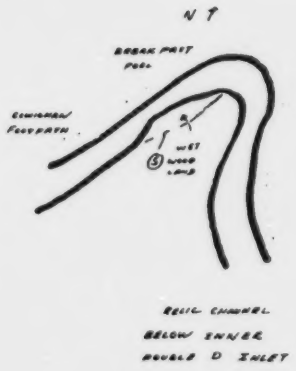
Wetted area increase = 720 m^2

Pond pool = 230 sq meters

= 19 ch meters

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: CHEMAINUS
Watershed Code:
Sidechannel No.: 104 R NTS Map: 92 B/13
Site Location:
17 / 7 / 87 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 594 flight line: 051, 052 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 24
Access: FROM BOTTOM OF DOUBLE Water Temp. °C: 18.5
FEED POOL, RIME AND BRAID, CROSS HEAD OF OUTER DOUBLE D OR MAIN RIVER

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	100
Avg. Wetted Width (m)	2	Total Riffle (%)	
Total Length (m)	130	Total Run (%)	
Total Wetted Area (m^2)	260	Total Glide (%)	
Ave. Slope (%)	1	Total Slough (%)	
Debris (%)	30	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	4
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE. OCCASIONAL LIGHT SPILL FROM RIVER IN FLOODS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 104 R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
19/9/85	7	0	130	2	260	650
18/2/86	160	.M		5	650	
1/7/87	24	0		2	260	

FISH UTILIZATION

Cold spawn in this channel, mainly in the lower 80 M. Approximately 300 fry are trapped in isolated pools. losses are low however because pools persist until autumn and temperature does not exceed 20° There is some slight near surface groundwater seepage and the channel is completely shaded. Coho may winter in this channel

ENHANCEMENT ASSESSMENT

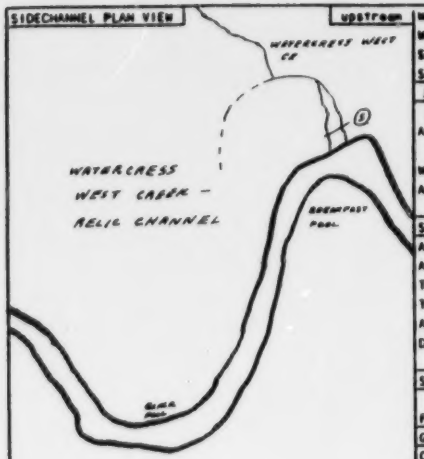
A buried pipe that would provide slight flow and not allow high water flow could optimize the yield of this channel

Wetted area increase = 390 m^2

Buried pipe = 124 cu smo/ft

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 105 R NTS Map: 92 B/13
Site Location: HEAD OUTLET
87 | 9 | 9 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BCC 404 flight line: 051, 052 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 32
Access: B.R.S., COWICHAN Water Temp. °C: 10
FOOTPATH

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	40	Total Pool (%)	69
Avg. Wetted Width (m)	2.2	Total Riffle (%)	18
Total Length (m)	500	Total Run (%)	
Total Wetted Area (m^2)	1100	Total Glide (%)	13
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil (1) M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT	
Channel Width (m)	1.6	.6
Wetted Width (m)	1.6	.6
Avg. Depth (cm)	17	.03
Wetted X-Sec Area (m^2)	.27	.05
Avg. Velocity (m/sec)	.32	.09
Flow (m^3/sec)	.0539	.0172
Mainstem Discharge (m^3/sec)	.448	

Gradient Profile: Longitudinal)

Comments:

THIS CHANNEL IS OCCUPIED BY A GROUNDWATER CREEK IN ITS LOWER 220 M

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 105 R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
12/9/85	.5	.006	500	4	2000	2800
10/4/85	40	.12	500	5	2500	
9/5/87	30	.0	500	2.2	1100	
8/8/87	.448	.0681	500	2.2	1100	

FISH UTILIZATION

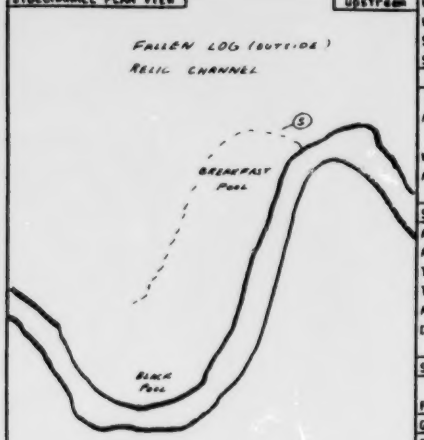
Coho - outlet spawning, rearing and wintering

ENHANCEMENT ASSESSMENT

No improvement necessary

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 106R NTS Map: 92 B/13
Site Location:
87 | 8 | 4 Time: Agency: Crew: TD
yr mo day
Air Photo Location No.: BCC 404 051, 052
flight line photo nos.
Weather: CLEAR, HOT Air Temp. °C: 32
Access: RR 5/, COWICHAN Water Temp. °C:
FOOTPATH

SIDECHANNEL SUMMARY

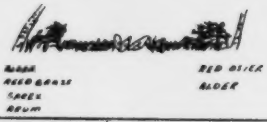
Avg. Chan. Width (m)	50	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	400	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.001	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	8	
Gravel	2	
Cobbles	0	
Boulders	0	
Bedrock	0	

downstream Compaction Hill L M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

WETTED BY WATER TABLE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 106R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
9/5/87	30	011	400	20	1000	20000
8/8/87	443	0		0	0	

FISH UTILIZATION

Coho overwintering.

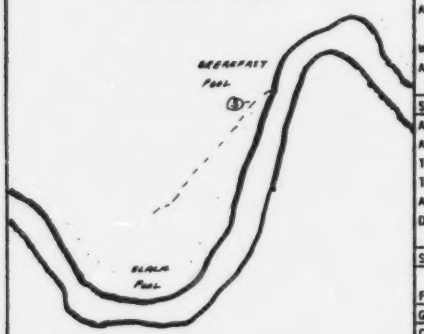
ENHANCEMENT ASSESSMENT

Excavation might provide permanent flow, particularly if combined with mainstem diversion. Mud will pose a problem for diversion.

Wetted area increase = 20,000 m^2
Yield potential = 6400 coho smolts
= 3200 ch smolts
= 10,000,000 cm fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: CONNAUGHAN

Watershed Code:

Sidechannel No.: 107 R NTS Map: 93 B/13

Site Location: 30 M ABOVE MAINSTEM

87 | 9 | 5 Time: ____ Agency: ____ Crew: TB
yr mo day

Air Photo Location No.: BCC404 flight line: 051, 052 photo nos.

Weather: CLEAR, HOT Air Temp. °C: 32

Access: BR 51, CONNAUGHAN FOOTPATH Water Temp. °C: ____

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	370	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	001	Total Slough (%)	
Debris (%)	15	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	0
Gravel	0
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream

Compaction Nil L M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal

Comments:

THIS CHANNEL IS WETTED BY THE WINTER WATER TABLE AND MINOR BACKFLOODING FROM THE RIVER

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 107 R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
9/5/87	30	.056	370	3	1110	5550
3/8/87	441	0		0	0	

FISH UTILIZATION

Coho over wintering and spring - early summer rearing

ENHANCEMENT ASSESSMENT

excavation and mainstem diversion could provide permanent wetting

Wetted area increase = 5550 M^2

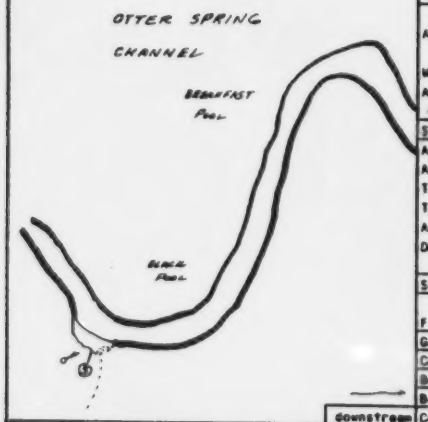
Juvenile Coho = 1760 20 smolts

= 881 ch smolts

= 2,775,000 cm fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 108R NTS Map: 92 B/13
Site Location:
87 | 8 | 8 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 484 flight line 051, 052 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 32
Access: WADE COWICHAN FROM FOOTPATH OR DIKE DOWN FROM TO 2 TRESTLE Water Temp. °C: 9.5

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	5	Total Pool (%)	93
Avg. Wetted Width (m)	3	Total Riffle (%)	2
Total Length (m)	140	Total Run (%)	
Total Wetted Area (m^2)	420	Total Glide (%)	5
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	4
Cobbles	0
Boulders	0
Bedrock	0

Comments:

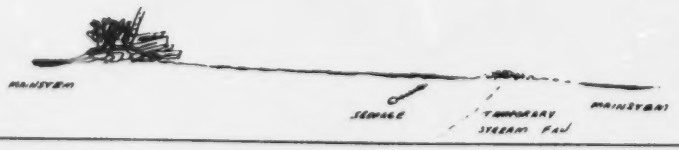
Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.07
Wetted Width (m)	.07
Avg. Depth (m)	.125
Wetted X-Sec Area (m^2)	.00875
Avg. Velocity (m/sec)	1
Flow (m^3/sec)	.000 7175 (.0177 CFS)
Mainstem Discharge (m^3/sec)	4.43

Gradient Profile: Longitudinal)



Comments:

WETTED BY :

1 SEEPAGE THROUGH THE INLET BERM

2 WINTER WATER TABLE

3 UPLAND SEEPAGE

4 VERY OCCASIONAL SURFACE RUN-OFF

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 108 R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
1/7/87	19	.00225	140	4	560	700
8/8/87	4.43	.000 7875		3	420	

FISH UTILIZATION

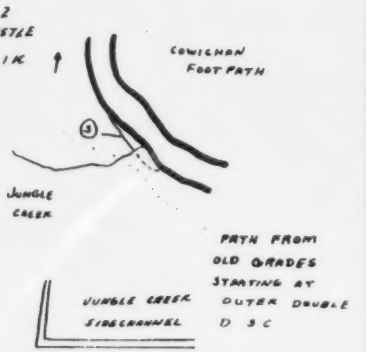
Coho summer rearing and probable overwintering

ENHANCEMENT ASSESSMENT

No improvement required

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 109F NTS Map: 92 B/13
Site Location:
87 | 7 | 1 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BCC 404 flight line 051, 032 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 24
Access: HIKE UP FROM Water Temp. °C:
QUITE POSSIBLE D AFTER XING THE RIVER AT LOWER MAPLETREE

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	7	Total Pool (%)	50
Avg. Wetted Width (m)	1.6	Total Riffle (%)	50
Total Length (m)	110	Total Run (%)	
Total Wetted Area (m^2)	176	Total Glide (%)	
Ave. Slope (%)	5	Total Slough (%)	
Debris (%)	2	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	7
Cobbles	1
Boulders	1
Bedrock	0

Comments:

downstream

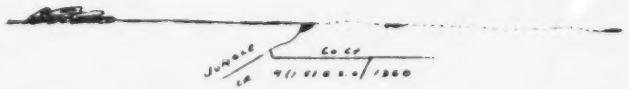
Compaction Nil (1) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	1.5
Wetted Width (m)	1.5
Avg. Depth (cm)	.04
Wetted X-Sec Area (m^2)	.06
Avg. Velocity (m/sec)	.4
Flow (m^3/sec)	.00192 (.067 CFS)
Mainstem Discharge (m^3/sec)	19

Gradient Profile:
Longitudinal)



Comments:

UPPER 60 M IS PERMANENTLY WETTED THE LOWER 50 M IS ONLY WETTED BY WINTER FLOWS.

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No.: 109F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
1/7/87	19	.00192	110	1.6	176	770
8/8/87	4.48	0		.013	66	

FISH UTILIZATION

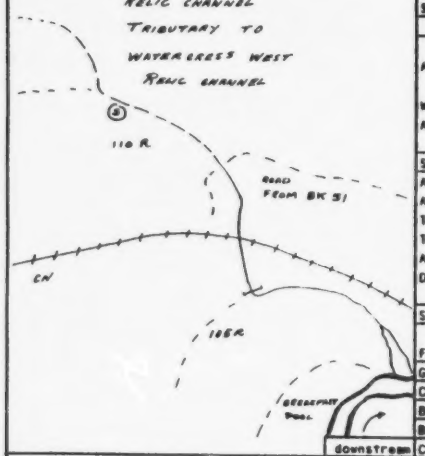
Coho spawning and spring - early summer rearing

ENHANCEMENT ASSESSMENT

No evident opportunities

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 110 R NTS Map: 92 B/13
Site Location:
87 | 7 | 30 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 904 051, 052
flight line photo nos.
Weather: RAIN Air Temp. °C: 18
Access: JERVIS FALLS RD, BK 51 RD Water Temp. °C: 7

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	2000	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	NIL
		Total	100%

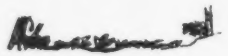
SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	1
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream Compaction NIL L (M) H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

A GROUNDWATER CREEK (WATERCRESS WEST) OCCUPIES THIS CHANNEL THE STREAM IS PERMANENT BELOW 630 m (FROM THE MAINSTEM) BUT HIGHLY INTERMITTANT ABOVE IT DRIES COMPLETELY BY JUNE IN MOST YEARS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No.: 110 R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
30/4/87	29	001	40	2	80	11/100
4/5/87	30	001	40	2	80	11/100
30/7/87	7	0	0	0	0	0

FISH UTILIZATION

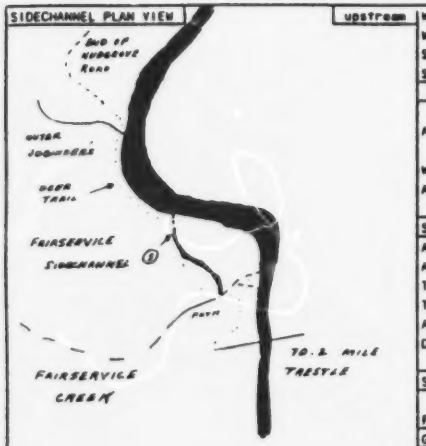
coho - outflow wintering.

ENHANCEMENT ASSESSMENT

No improvement possible without extensive excavation and channel improvement.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: III A NTS Map: 92 C/16
Site Location: NEAR INLET
87 | 6 | 15 (yr mo day) Time: ____ Agency: ____ Crew: TB
Air Photo Location No.: BC 81009 (flight line) 003, 004 (photo nos.)
Weather: CLOUD AND SUN Air Temp. °C: 19
Access: HUDGROVE RD OR ON TRACKS Water Temp. °C: 12

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool ($)	70
Avg. Wetted Width (m)	7	Total Riffle ($)	30
Total Length (m)	280	Total Run ($)	
Total Wetted Area (m^2)	1960	Total Glide ($)	
Ave. Slope ($)	.1	Total Slough ($)	
Debris ($)	10	Turbidity (cm)	NIL
		Total	100$

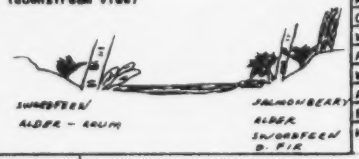
SUBSTRATE COMPOSITION

	$
Fines	3
Gravel	6
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction NIL (L) M H

Sidechannel Cross-Section (downstream view)



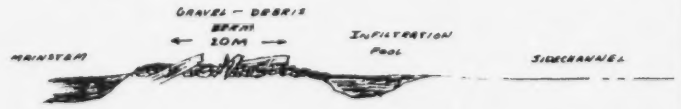
Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.72
Wetted Width (m)	.72
Avg. Depth (cm)	.04
Wetted X-Sec Area (m^2)	.028
Avg. Velocity (m/sec)	.09
Flow (m^3/sec)	.0025 (.01CFS)
Mainstem Discharge (m^3/sec)	20

Gradient Profile: Longitudinal)

FLOW IS FROM SEEPAGE THROUGH THE INLET BERM WHICH IS OCCASIONALLY OVERTOPPED IN WINTER THERE IS ALSO WINTER - SPRING BACKFLOODING FROM FAIRSERVICE CREEK

Comments:



SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. III A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
27/5/87	19	.00003	280	7	1960	2240
15/6/87	20	.0025		7	1960	
20/7/87		0		7	1960	
7/9/87		0		6	1680	

FISH UTILIZATION

An important coho spawning, rearing, and wintering channel. Fish enter from Fairservice Creek

Chum spawning in big years

ENHANCEMENT ASSESSMENT

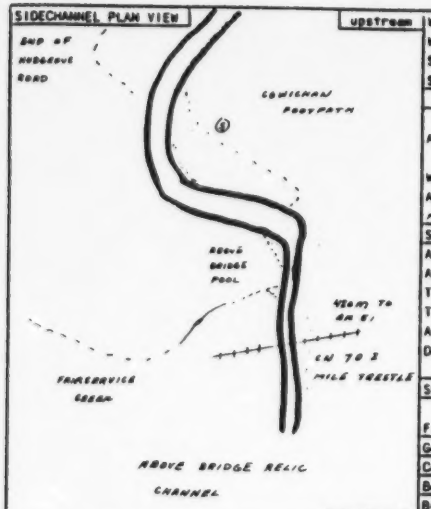
Deepening at the upper end may provide permanent flow which with some excavation of high spots

Wetted area increase = 560 M^2

Yield potential = 176 CO SMOLTS

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 112R NTS Map: 92C/16
Site Location: 100 m BELOW INLET
87 | F | 7 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BC 87008 001, 002
flight line photo nos.
Weather: CLEAR, HOT Air Temp. °C: 34
Access: COWICHAN FOOTPATH Water Temp. °C:
FROM 2M S/ OF WOOD RIVER FROM END OF HUDGROVE ROAD

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	15	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	882	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	5.32

Gradient Profile: Longitudinal)

Comments:

UNLIKE MANY RELIC CHANNELS, THIS ONE IS NEVER WETTED EXCEPT FOR SOME SHORT STRETCHES NEAR ITS OUTLET WHERE IT BECOMES SOGGY AND HOSTS A FEW PUDDLES SUPPLIED BY THE WINTER WATER TABLE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 112R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
4/5/87	80	0	882	0	0	5730
7/8/87	5.32	0		0	0	

FISH UTILIZATION

Nil

ENHANCEMENT ASSESSMENT

Trenching the top end, installing a pipe, burying it and excavating below it could create a usable active channel

Wetted area increase = 5730 M^2

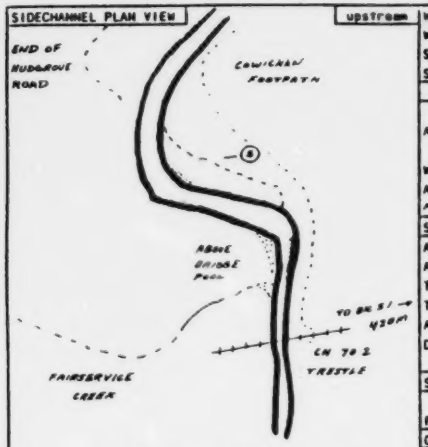
Yield pot = 2,865,000 cm fry

= 1833 co smolts

= 916 ch smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



ABOVE BRIDGE FLOOD CHANNEL

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 113F NTS Map: 92C/16
Site Location: CENTRAL
87 | 9 | 7 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BC 91009 001, 002
flight line photo nos.
Weather: CLEAR, HOT Air Temp. °C: 34
Access: COWICHAN FOOTPATH Water Temp. °C:
FROM BR 5 OR WADE RIVER FROM END OF HUDGROVE RD

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)		Total Riffle (%)	
Total Length (m)	264(TMS)	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	5	Total Slough (%)	
Debris (%)	1	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

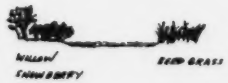
	%
Fines	2
Gravel	7
Cobbles	1
Boulders	0
Bedrock	0

Comments:

downstream

Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	5.32

Gradient Profile:
Longitudinal

Comments:

A RELATIVELY STABLE FLOODCHANNEL

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 113F

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
4/5/87	30	0	264(TMS)	2	65	1584
7/8/87	5.32	0		0	0	

FISH UTILIZATION

Coho and chinook fry were present in the two pools still remaining on May 4, 1987, ten coho, ten chinook. Although coho spawning is possible, it's probable the fish entered from the mainstem. The bar adjacent to the channel is an important coho, steelhead and chinook spawning site.

Chum spawning in some years.

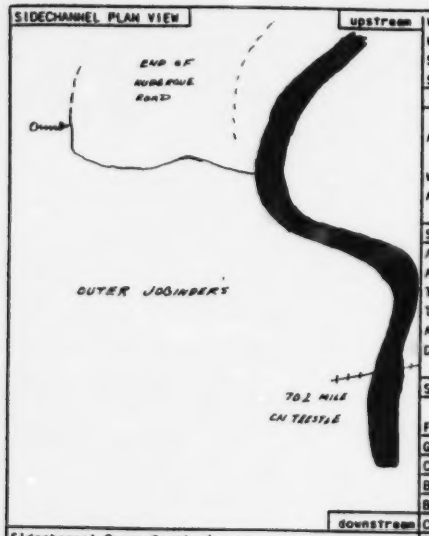
ENHANCEMENT ASSESSMENT

Excavation might provide permanent flow. The channel is relatively stable and par enough removed from the river that improvement should persist.

Increased wetted area = 1584 m^2
Yield potential = 792,000 c.u.ft.s.
= 5.16 CO SMOLTS
= 254 CH SMOLTS

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 114A NTS Map: 92C/16
Site Location: COWICHAN CONFLUENCE
87 | 5 | 27 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: BC 91009 flight line 003, 004 photo nos.
Weather: CLOUDY, COOL Air Temp. °C: 14
Access: HUDGROVE RD Water Temp. °C: 8

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	60
Avg. Wetted Width (m)	2	Total Riffle (%)	20
Total Length (m)	720	Total Run (%)	
Total Wetted Area (m^2)	1440	Total Glide (%)	20
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	2
Cobbles	1
Boulders	0
Bedrock	0

Comments:

downstream

Compaction Nil L (M) H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	1
Wetted Width (m)	1
Avg. Depth (cm)	.08
Wetted X-Sec Area (m^2)	.08
Avg. Velocity (m/sec)	1
Flow (m^3/sec)	.032 (1.13 CFS)
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

PORTION OF FLOW IS FROM A SIDEHILL SPRING AT 600M. IT ACCOUNTS FOR 29 PERCENT OF WINTER FLOW BUT A LARGE PROPORTION OF SUMMER DISCHARGE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No.: 114A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
7/4/87	40	.096	720	4	2880	4320
27/5/87	19	.032		2	1440	
11/3/87		17		6	4320	
20/7/87	7	.012		1	720	
7/8/87	5.32	.019		1.16	835	

FISH UTILIZATION

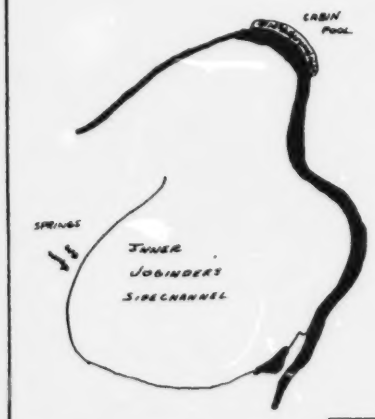
Coho spawn, rear and winter in this cold water channel. Brown trout fry have been reported (Burns, 1987)

ENHANCEMENT ASSESSMENT

No improvement necessary

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW — upstream



downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 115A NTS Map: 92C/16
Site Location: INNER JOGINDERS
17 | 5 | 87 (yr mo day) Time: ____ Agency: ____ Crew: TB
Air Photo Location No.: BC 87009 (flight line) 003 ; 004 (photo nos.)
Weather: MOSTLY CLOUDY Air Temp. °C: 14
Access: HUBBARD RD Water Temp. °C: 12

SIDECHANNEL, SUMMARY

Avg. Chan. Width (m)	13	Total Pool (%)	60
Avg. Wetted Width (m)	10	Total Riffle (%)	10
Total Length (m)	1080	Total Run (%)	
Total Wetted Area (m^2)	10800	Total Glide (%)	30
Ave. Slope (%)	.3	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	N/A
		Total	100%

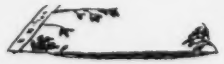
SUBSTRATE COMPOSITION

	%
Fines	2
Gravel	4
Cobbles	1
Boulders	1
Bedrock	0

Comments:

Compaction Nil L (M) H

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	13
Wetted Width (m)	10
Avg. Depth (cm)	.13
Wetted X-Sec Area (m^2)	.3
Avg. Velocity (m/sec)	.36
Flow (m^3/sec)	.09
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

A MAJOR SIDECHANNEL, SPRINGS PROVIDE MUCH OF ITS FLOW DURING THE SUMMER. THEIR MEAN DISCHARGE APPROXIMATES .016 CMS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No.: 115A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
7/4/87	40	.32	1080	13	14040	14040
9/3/87		.60		13	14040	
27/5/87	19	.24		10	10800	
20/7/87	7	.22		9.4	10152	
7/9/87	5.52	.21		8.4	9072	
10/3/88	42	.32		13	14040	

FISH UTILIZATION

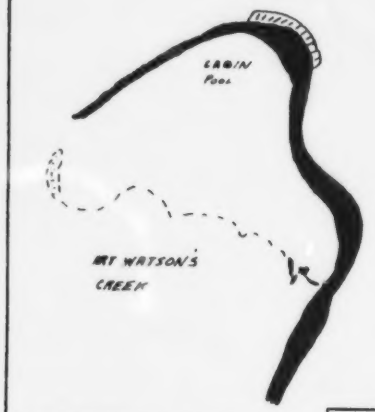
COHO, STEELHEAD AND BROWN TROUT SPAWN, SUMMER REAR AND WINTER IN THIS CHANNEL. AS MANY AS 400 COHO AND 50 CHUMS HAVE BEEN OBSERVED

ENHANCEMENT ASSESSMENT

NO IMPROVEMENT REQUIRED

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 116R NTS Map: 92C/16
Site Location: MT WATSON'S CREEK
87 | 4 | 7 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BC 81009 flight line 005, 004 photo nos.
Weather: RAIN Air Temp. °C: 7
Access: MUDGROVE RD Water Temp. °C: 7

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	4	Total Pool (%)	87
Avg. Wetted Width (m)	1	Total Riffle (%)	13
Total Length (m)	960	Total Run (%)	
Total Wetted Area (m^2)	960	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	45
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	.5
Wetted Width (m)	.5
Avg. Depth (cm)	.04
Wetted X-Sec Area (m^2)	.02
Avg. Velocity (m/sec)	.25
Flow (m^3/sec)	.004 (14 cfs)
Mainstem Discharge (m^3/sec)	31

Gradient Profile:
Longitudinal)

Comments:

DUG OUT PONDS AT LOWER END USED FOR DOMESTIC RAINBOW REARING

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 116R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
7/4/87	31	.004	1220	1	1220	4880
27/5/87	19	0	260	1	260	
20/7/87	7	0	260	1	260	
10/3/87	42	19	1220	4	4880	

FISH UTILIZATION

Possibility of coho spawning and overwintering. a few brown trout fry are present in the dug out ponds which also serve as a temporary holding area for coho fry salvaged in this area. Chum also utilize this creek as do cutthroats.

1987 escapement:
Co 60
Cm 50

ENHANCEMENT ASSESSMENT

Extending excavation upstream and adding spawning gravel could yield considerable coho benefit

Wetted area increase = 4620 m^2
Yield pot = 14.5 Co smolts
= 2,310,000 cm fry

area of excavation = 768 m^2 This figure is not included in wetted area because it may not be available to wild fish

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 117F NTS Map: 92C/16
Site Location: NEAR OUTLET
77 | 8 | 8 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BC81009 flight line: 088, 084 photo nos.
Weather: SUNNY, HOT Air Temp. °C: 32
Access: HUDDLESTONE RD Water Temp. °C: NA

SIDECHANNEL, SUMMARY

Avg. Chan. Width (m)	4	Total Pool ($)	100
Avg. Wetted Width (m)	0	Total Riffle ($)	
Total Length (m)	190	Total Run ($)	
Total Wetted Area (m²)	0	Total Glide ($)	
Ave. Slope ($)	.5	Total Slough ($)	
Debris ($)	1	Turbidity (cm)	
		Total	100$

SUBSTRATE COMPOSITION

	$	Comments:
Fines	1	
Gravel	F	
Cobbles	1	
Boulders	0	
Bedrock		

downstream

Compaction Nil (L) M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m²)	
Avg. Velocity (m/sec)	
Flow (m³/sec)	0
Mainstem Discharge (m³/sec)	4.48

Gradient Profile:
Longitudinal)

Comments:

WETTED BY RIVER SEEPAGE THROUGH THE BERM AND THE WATER TABLE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 117F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
7/4/87	31	.003	190	55	420	760
5/5/87	30	0		.30	57	
21/6/87	21	0		.25	53	
3/9/87	4.48	0		0	0	
10/3/88	42	.192		4	760	

FISH UTILIZATION

Coho and chum salmon spawn in this channel and early coho fry enter it from the mainstem to rear. A few coho overwinter in this channel and small numbers of chinook fry rear in it in the spring. Up to 18,000 coho fry have been salvaged from the 760 m² channel. 1987 salvage figures were 5000 coho fry, 70 coho parr - 3 mo/1+, 600 chum fry and 250 chinook fry - parr - 3 mo/1+.

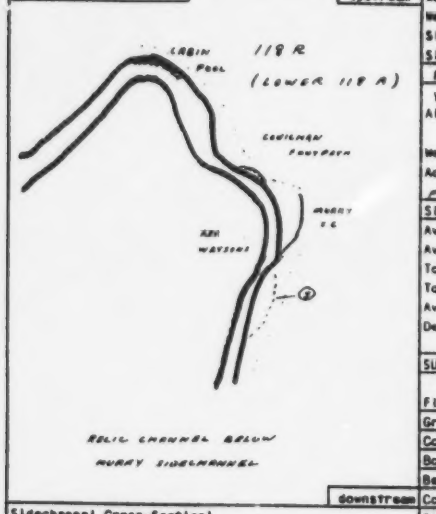
ENHANCEMENT ASSESSMENT

This channel was created by pick and shovel (avoid) to provide water to spawning redds subject to drying when mainstem flows dropped. It could be further improved by more excavation and the addition of a buried water line.

Wetted area increase = 730 m²
Yield pot = 240 CO SMOLTS

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 118 R NTS Map: 92 C/16
Site Location:
17 | 8 | 7 (yr mo day) Time: ____ Agency: ____ Crew: TB
Air Photo Location No.: BC 91009 flight line: 001, 002 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 32
Access: COWICHAN FOOTPATH Water Temp. °C: ____
FROM BR 91 BE WHERE RIVER AT KEN WATSON'S

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	200	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	15	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	5
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M(H)

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	5.32

Gradient Profile: Longitudinal)

Comments:

THIS CHANNEL IS OBSCURE AND RATHER ILL DEFINED. I DEBATED WHETHER OR NOT TO INCLUDE IT. IT IS NEVER WETTED EXCEPT FOR BACK FLOODING IN EXTREME MAINSTEM FLOWS. EVEN THEN, WATER ONLY BACKS UP FOR LESS THAN 50 M

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 118 R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
4/8/17	30	0	200	0	0	1200
7/8/17	5.32	0		0	0	

FISH UTILIZATION

None

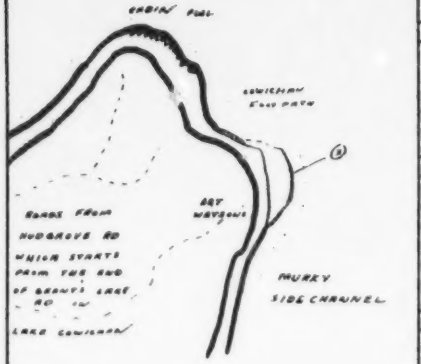
ENHANCEMENT ASSESSMENT

In the long, long view, this channel could provide perennial flow by breaching the berm, installing a pipe or French drain, reconstructing the berm, then excavating the channel.

Wetted area increase = 1200 m^2
Wetted pot = 384 co smolts
= 192 ch smolts
= 600,000 em Fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW — upstream


CABIN
COWICHAN FLOW PATH
RANGE FROM HUDGROVE RD WHICH STARTS FROM THE END OF BRENTS LAKE RD IN LAKE COWICHAN
BAY WATSONS
MURKY SIDE CHANNEL

downstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 118A NTS Map: 92 C/16
Site Location: CENTRAL
87 | 9 | 7 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BCC 404 052, 053
flight line photo nos.
Weather: CLEAR, HOT Air Temp. °C: 32
Access: HIKE COWICHAN FOOTPATH Water Temp. °C: 13
FROM BA 91 OR WADE OR BOAT RIVER FROM HUDGROVE RD POINTS

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	75
Avg. Wetted Width (m)	3	Total Riffle (%)	25
Total Length (m)	385	Total Run (%)	
Total Wetted Area (m^2)	1	Total Glide (%)	
Ave. Slope (%)	01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	30 IN SLOUGH 100+
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	3
Cobbles	1
Boulders	0
Bedrock	

Comments:

Compaction Hil L (M) H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	3
Wetted Width (m)	3
Avg. Depth (cm)	01
Wetted X-Sec Area (m^2)	003
Avg. Velocity (m/sec)	65
Flow (m^3/sec)	.00012 (0.012 cfs)
Mainstem Discharge (m^3/sec)	5.32

Gradient Profile: Longitudinal)

Comments: WETTED BY SEEPAGE THROUGH THE INLET BAR AND THE WINTER WATER TABLE SURFACE FLOW IS NIL A PATCH EXCEPT IN EXTREME FLOODS EVEN THEN ; FLOWS ARE NOT ABRASIVE

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 118A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
12/9/86	6	.001	385	3	1155	1310
4/5/87	30	.014		4	1540	
7/8/87	5.32	.00012		3	1540	

FISH UTILIZATION

Coho fry winter and summer rearing in this channel. There is a high probability of spawning & fry warrant fry were seen on August 7, 1987

ENHANCEMENT ASSESSMENT

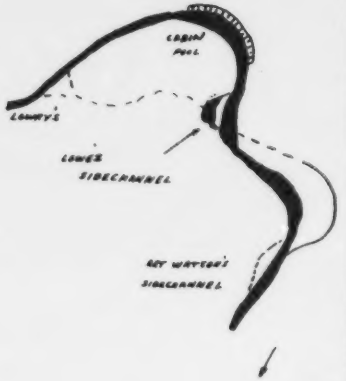
Excavation of a deep infiltration pool at the upper end of wetland would improve summer flows

Wetted area increase = 1155 m^2

Yield pot = 396 coho smolts

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 119A NTS Map: 92C/16
Site Location:
17 | 6 | 15 | Time: | Agency: | Crew: TB
yr mo day
Air Photo Location No.: BC 91009 flight line 008, 004 photo nos.
Weather: SUN AND CLOUD, COOL Air Temp. °C: 16°
Access: NORCROVE RD TO KEY WATSON'S RD Water Temp. °C: 17°

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool ($)	70
Avg. Wetted Width (m)	8	Total Riffle ($)	30
Total Length (m)	70	Total Run ($)	
Total Wetted Area (m²)	1260	Total Glide ($)	
Ave. Slope ($)	.5	Total Slough ($)	
Debris ($)	0	Turbidity (cm)	NIL
		Total	100$

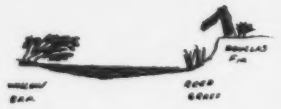
SUBSTRATE COMPOSITION

	$
Fines	2
Gravel	8
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil (L) M H

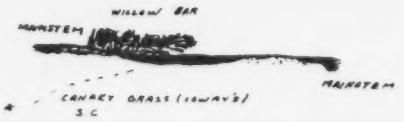
Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	6.8
Wetted Width (m)	6.8
Avg. Depth (cm)	.32
Wetted X-Sec Area (m²)	2.2
Avg. Velocity (m/sec)	.66
Flow (m³/sec)	1.16 (40.96 cfs)
Mainstem Discharge (m³/sec)	20

Gradient Profile: Longitudinal



Comments:

INUNDATED AT HIGH FLOWS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 119A Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
15/6/87	20	1.16	70	18	1260	1400
20/7/87		.14		15	1050	
7/9/87	5.82	.0224		13	910	

FISH UTILIZATION

Supports late spawning and summer rearing. Early steelhead fry also rear along with a few parr.

This an important early holding pool during upstream migration - a good brood stock collection site.

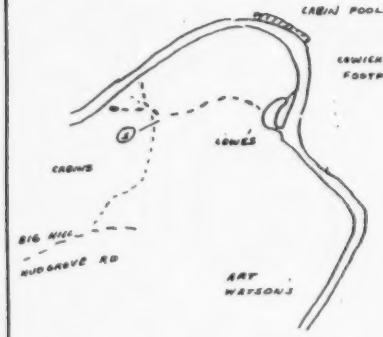
Heavy chum spawning in some years.

ENHANCEMENT ASSESSMENT

No improvement required

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



LOWRYS SIDECHANNEL (CANARY GRASS)

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 120R NTS Map: 92 C/16
Site Location: NEAR INLET
87 / 8 / 9 Time: ____ Agency: ____ Crew: TG
yr mo day
Air Photo Location No.: BC81009 flight line: 002, 009 photo nos.
Weather: CLEAR, HOT Air Temp. °C: 30
Access: MUDGROVE RD. TURN Water Temp. °C: 18
LEFT AT BOTTOM OF BIG HILL

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	360	Total Run (%)	
Total Wetted Area (m^2)	25	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

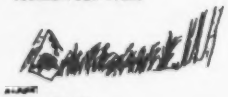
	%
Fines	7
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments: HEAVY REED GRASS AND REED CANARY GRASS IN MOST OF THE CHANNEL

downstream

Compaction Nil L (M) H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	448

Gradient Profile:
Longitudinal)

Comments:

A BERM HAS BEEN BULLDOZED NEAR THE INLET

A SINGLE POOL REMAINS THROUGH THE SUMMER

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 120R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
13/11/86	65	.040	360	1	360	3600
7/4/87	30	0		.07	280	
27/5/87	19	0		.01	50	
8/8/87	448	0		.007	25	

FISH UTILIZATION

Important coho - cutthroat winter habitat.
600 coho, 50 cutthroats (including a 30 cm fish) and 50 steelheads were sunid April 4, 1986. The coho parr ranged from 60 to 100 mm. Fish were in a 10 m^2 pool.
Chum spawning use some years.

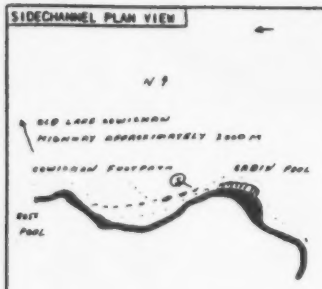
ENHANCEMENT ASSESSMENT

a buried pipe, super infiltration pool and spot excavation could provide permanent flow. Care must be taken to ensure water flows remain low.

Wetted area increase - 3600 m^2
Gravel req'd = 1152 cu yds @ $1.5/cu yd
= 576 cu yds @ $3.00/cu yd
= 1,800,000 coho fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 121R NTS Map: 92C/16
Site Location: BETWEEN ROSS AND CABIN POOLS
87 | 6 | 9 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BC 81009 flight line: 008 - 004 photo nos.
Weather: CLOUDY Air Temp. °C: 16°
Access: COWICHAN FOOTPATH Water Temp. °C: 10°
FROM RIPPLE RD. ENTRANCE

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	100
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	400	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments: GRAVEL IS PRESENT UNDERNEATH THE SURFACE

downstream

Compaction: NIL L M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary	NA
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

BREAKFLOODS 70M IN WINTER THEN IS SPORADICALLY WETTED BY HIGH WATER TABLE DURING NORMAL WINTER FLOWS IN FLOODS, THERE IS OCCASIONAL LIGHT SPILL FROM THE MAINSTEM

THREE POOLS REMAIN UNTIL EARLY SUMMER ONLY ONE PERSISTS UNTIL FALL RAINS RECUR IT IS FED BY A TINY UPWELLING OF GROUNDWATER

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 121R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
19/4/87	47	0	400	.06	150	2400
9/5/87	19	0		.03	120	
7/8/87	5.32	0		.01	28	
4/10/87		0			10	

FISH UTILIZATION

A few coho fry enter this channel during high flows but most stopped when flow ceases in February, March or April. Less than 100 survive the summer. None survived the summer of 1987. Juvenile steelhead were monitored in the channel in '86 & '87. They were trapped by April and salvaged to the mainstem along with a few coho pre-smolts

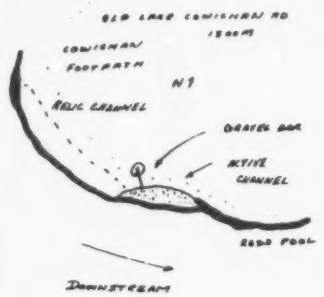
ENHANCEMENT ASSESSMENT

A buried weir underneath the berm followed by a deep infiltration pool and spot excavation would provide permanent flow

Wetted area increase = 2400 m^2
Yield potential = 768 coho smolts
= 384 ch smolts
= 1,200,000 cm fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



ROSS POOL ACTIVE CHANNEL

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 122A NTS Map: 92C/16
Site Location: NEAR INLET
97 | 6 | 9 Time: 1310 Agency: Crew: TB
yr mo day
Air Photo Location No.: BC 71009 flight line: 003 - 004 photo nos.
Weather: CLOUDY, COOL Air Temp. °C: 16°
Access: COWICHAN FOOTPATH Water Temp. °C: 16° (10 AT UPWELLING SPOTS)
FROM ROSS RD ENTRANCE

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	30
Avg. Wetted Width (m)	10	Total Riffle (%)	70
Total Length (m)	100	Total Run (%)	
Total Wetted Area (m²)	1000	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	1	Turbidity (cm)	NIL
		Total	100%

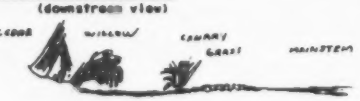
SUBSTRATE COMPOSITION

	%
Fines	3
Gravel	6
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction Nil (L) M H

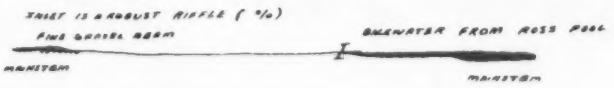
Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	10
Wetted Width (m)	10
Avg. Depth (cm)	40 (.4 m)
Wetted X-Sec Area (m²)	4
Avg. Velocity (m/sec) x .8	.5
Flow (m³/sec)	2.4 (84.72 CFS)
Mainstem Discharge (m³/sec)	17

Gradient Profile: Longitudinal)



Comments:

INUNDATED IN FLOODS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 122A Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
19/4/87	44	5.6	100	10	1000	1000
9/6/87	17	3.4		10	1000	
1/8/87	7	.089		6	600	
7/8/87	5.82	.003		5	500	

FISH UTILIZATION

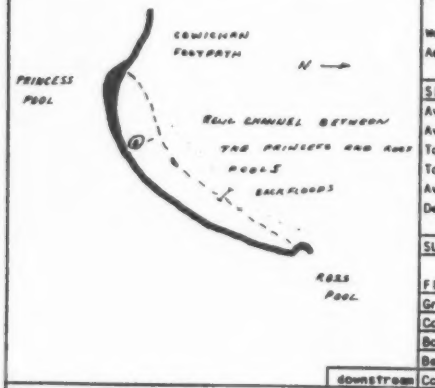
Heavily utilized by coho for rearing - summer rearing densities approach 10/m² around groundwater upwelling sites after mid-July. Chinook fry and pre-SMOLTS also use this channel. A chinook SMOLT was captured on June 9, 1989 - the latest I have ever seen in the Cowichan system aside from one other on June 19, 1986 near Koksilah.

ENHANCEMENT ASSESSMENT

No improvement necessary. It might be possible to provide some annual short term gains by breaching the inlet berm. It closes when mainstem flow falls below 6 cms because the composition of fine / loose gravel, a shovel would do the job. However, wetted area loss is minimal when the bar closes and the channel is only accessible by foot so this measure is probably not worthwhile.

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 123R NTS Map: 92 C/16
Site Location:
87 | 6 | 9 (yr mo day) Time: ____ Agency: ____ Crew: TB
Air Photo Location No.: BC 91009 (flight line) 003 - 004 (photo nos.)
Weather: CLOUDY; COOL Air Temp. °C: 16
Access: COWICHAN FOOTPATH FROM RIM'S RD Water Temp. °C: NA

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	6	Total Pool (%)	NA
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	190	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	NA	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Hi L M (H)

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	0
Mainstem Discharge (m^3/sec)	19

Gradient Profile:
Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE, BACKFLOODING AND OCCASSIONAL LIGHT SPILL FROM MAINSTEM COHO WINTER IN THE LOWER 70 M AND A FEW ARE SOMETIMES TRAPPED. ONE POOL REMAINED ON 4/19/87 IT CONTAINED THREE COHO PARR

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No.s 123R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
18/4/87	44	0	190	.01	31	1140
9/6/87	19	0		0	0	
7/8/87	5.32	0		0	0	

FISH UTILIZATION

Coho fry enter from the lower end during high water. Most leave before flow recedes in late winter or early spring but a few are trapped. One pool measured on April 19, 1987; it held three coho parr - pw. 380/ha.

ENHANCEMENT ASSESSMENT

It should be possible to provide permanent wetting via a buried drain underneath the berm and downstream excavation

Wetted area increase = 1140 m^2

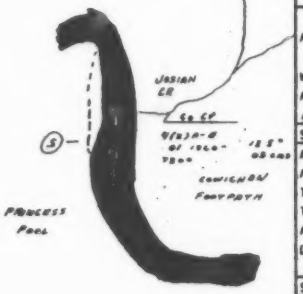
Yield pot = 361.20 smolts

= .82 ch smolts

= 570,000 cm pot

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN

Watershed Code:

Sidechannel No.: 124R NTS Map: 92C/16

Site Location: NEAR OUTLET

16 | 9 | 96 Time: Agency: Crew: TB

yr mo day

Air Photo Location No.: BC 91009 flight line 008, 009 photo nos.

Weather: CLOUDY, COOL Air Temp. °C: 14

Access: RUDGROVE RD OR Water Temp. °C:

WADE RIVER

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	300	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.1	Total Slough (%)	
Debris (%)	15	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	3
Cobbles	0
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M(H)

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	9

Gradient Profile: Longitudinal

Comments:

WATTED BY THE WINTER WATER TABLE AND BACKFLOODING

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No.s 124R	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
Day/Month/Year						
25/9/96	9	0	300	0	0	3000

FISH UTILIZATION

None

ENHANCEMENT ASSESSMENT

Could be excavated to provide permanent flow

Wetted area increase = 3000 m^2

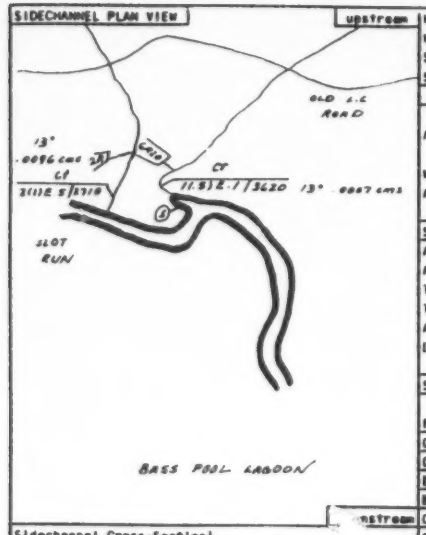
Wetted pot = 960 cc smolts

= 480 ch smolts

= 1,500,000 emi fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name COWICHAN

Watershed Code

Sidechannel No. 1258 NTS Map: 92 C/16

Site Location NEAR CENTER

87 | 9 | 18 Time ____ Agency ____ Crew TB
yr mo day

Air Photo Location No. BC 91009 flight line 004, 005 photo nos.

Weather CLEAR, WARM Air Temp. °C 23

Access TRAILS FROM OLD L.C Water Temp. °C 20
RD

SIDECHANNEL, SUMMARY

Avg. Chan. Width (m)	20	Total Pool (%)	
Avg. Wetted Width (m)	13	Total Riffle (%)	
Total Length (m)	40 (25)	Total Run (%)	
Total Wetted Area (m^2)	325	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	100
Debris (%)	5	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	1
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary	
Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

ONE OF A NUMBER OF PROTECTED BACKWATERS ON THE UPPER COWICHAN

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 1258

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
27/5/86	59	NA	40	20	800	800
30/5/87	19	NA	32	16	512	
18/9/87	7	NA	25	13	325	
1/5/87	30	NA	35	19	680	

FISH UTILIZATION

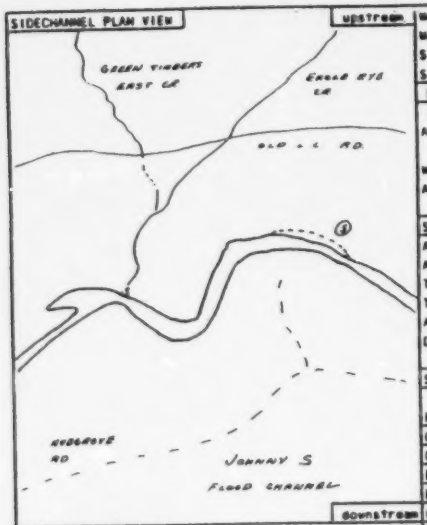
Heavily utilized by chinook and early coho fry. Coho use continues thru the summer and fall and perhaps winter. Cutthroat fry are found in the long groundwater tributary for a distance of 40 m

ENHANCEMENT ASSESSMENT

No improvement required

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 126 F NTS Map: 92G/11
Site Location: NEAR OUTLET
97 | 9 | 20 (yr mo day) Time: Agency: Crew: FB
Air Photo Location No.: BC 97009 Flight line: 004, 005 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 23
Access: RIDGEVIEW RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	9	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	105	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	50	Turbidity (cm)	
		Total	100%

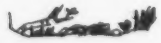
SUBSTRATE COMPOSITION

	%
Fines	5
Gravel	3
Cobbles	1
Boulders	1
Bedrock	0

Comments:

Compaction Mil L N

Sidechannel Cross-Section (downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal

Comments:

INUNDATED BY HIGH FLOWS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 126 F Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/9/97		0	105 (a)	0	0	940
25/5/97	20	0	9	2	18	
1/5/17	30	0	30	3	90	

FISH UTILIZATION

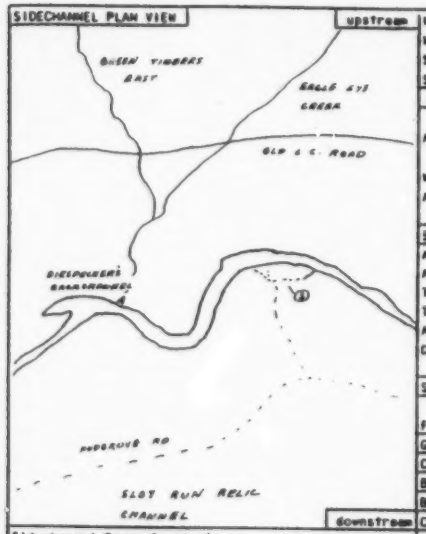
None although there is a chance of some overwintering coho

ENHANCEMENT ASSESSMENT

Improvement is not possible. The channel is too close to the mainstem and is inundated by high flows

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 127R NTS Map: 92C/16
Site Location: NEAR CENTRE
17 | 9 | 20 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BC 81009 flight line 009,005 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 22.
Access: HUDERUB RD Water Temp. °C:

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	140	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

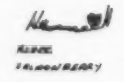
SUBSTRATE COMPOSITION

	%
Fines	6
Gravel	3
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction Hill L (M) H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE AND LIGHT SPILL FROM THE MAINSTEM IN HIGHWATER. FLOW CEASES BY LATE APRIL OR EARLY MAY. SCATTERED POOLS REMAIN UNTIL AUGUST

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 127R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length 140 (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
30/9/97		0	140 (e)	0	0	1120
25/5/97	20	0	10	3	30	
5/5/97	30	0	22	5	110	

FISH UTILIZATION

Possibility of coho overwintering.

ENHANCEMENT ASSESSMENT

Excavation could provide permanent wetting

Wetted area increase = 1120 m^2

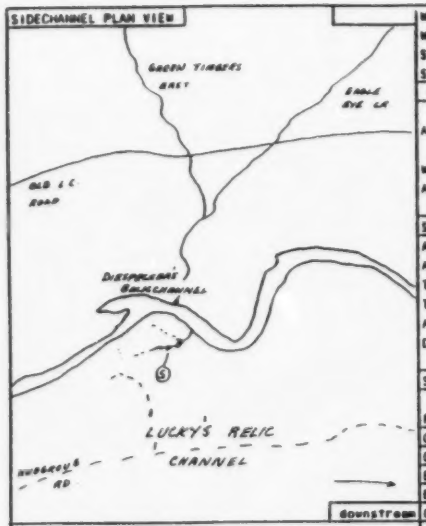
Yield potential = 358 CO smolts

= 179 CH smolts

= 560,000 cm Fry

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: OWICHAN
Watershed Code:
Sidechannel No. 128R NTS Map: 92C/16
Site Location NEAR CENTRE
87 | 9 | 20 Time: Agency: Crew: TB
yr mo day
Air Photo Location No. BC 81009 flight line 003, 806 photo nos.
Weather CLEAR, WARM Air Temp. °C 22
Access HUDGROVE RD, LUCKY Water Temp. °C
BURNER'S DRIVEWAY & RIVER ACCESS

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	8	Total Pool (%)	
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	155	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	2
Cobbles	1
Boulders	0
Bedrock	0

Comments:

downstream Compaction Nil L M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile: Longitudinal)

Comments:

WETTED BY WINTER WATER TABLE FLOW CEASES BY APRIL OR EARLY MAY. ISOLATED POOLS REMAIN UNTIL LATE MAY OR JUNE. MINOR BACKFLOODING

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 128R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
20/9/87		0	155	0	0	1240

FISH UTILIZATION

Possibility of overwintering coho

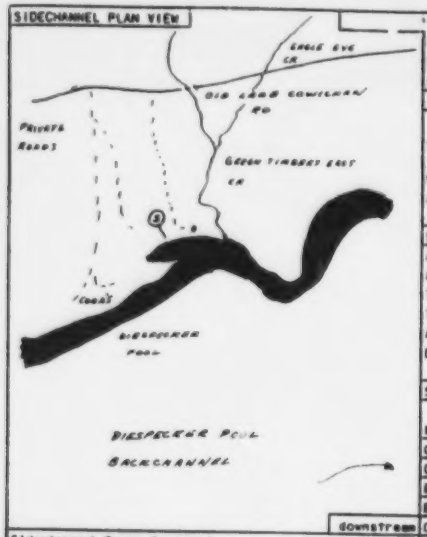
ENHANCEMENT ASSESSMENT

Excavation may provide permanent wetting out at high cost.

Wetted area increase = 1240 m^2
= 396 cu smolt
= 148 ch smolts
= 620,000 cm flow

SIDECHANNEL ASSESSMENT Form

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 1298 NTS Map: 92 C/16
Site Location:
87 | 8 | 10 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: BC 87009 005, 006
flight line photo nos.
Weather: PARTLY CLOUDY, COOL Air Temp. °C: 17
Access: PRIVATE GRAVEL ROAD FROM Water Temp. °C: 11
COWICHAN LAKE RD

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	25	Total Pool (%)	
Avg. Wetted Width (m)	10	Total Riffle (%)	
Total Length (m)	70	Total Run (%)	
Total Wetted Area (m^2)	700	Total Glide (%)	
Ave. Slope (%)	0	Total Slough (%)	100
Debris (%)	1	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	9
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

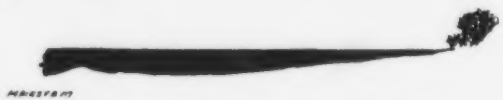
downstream Compaction Nil L M H

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	4.48

Gradient Profile: Longitudinal)



Comments:

A LARGE BACKCHANNEL THAT IS IN DIRECT PHASE WITH RIVER FLOW. SIDECHANNEL FLOWING OCCURS EVEN AT HIGH FLOWS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 1298 / Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
3/4/82	31	NA	70	25	1750	1750
12/3/87		NA	70	25	1750	
29/5/87	20	NA	65	30	1900	
10/3/87	4.48	NA	60	10	600	

FISH UTILIZATION

Heavily utilized by newly emergent fry - coho, cutthroat and steelhead. Coho remain over the summer. High probability of coho and steelhead overwintering.

ENHANCEMENT ASSESSMENT

No improvement necessary

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

Watershed Name COWICHAN
Watershed Code
Sidechannel No. 129R NTS Map: 92C/16
Site Location ROAD KING
97 | 3 | 12 Time Agency Crew TB
yr mo day
Air Photo Location No. BC 91009 flight line 009 | 005 photo nos.
Weather CLOUDY ; COOL Air Temp. °C 10
Access COOKS DRIVEWAY Water Temp. °C
FROM COWICHAN LAKE ROAD

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	12	Total Pool (%)	NA
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	360	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	20	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments:

downstream Compaction Nil L M H

Sidechannel Cross-Section
(downstream view)

Sidechannel Discharge Summary

Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	

Gradient Profile:
Longitudinal)

Comments: LOWER 100 M WETTED BY THE WINTER WATER TABLE AND BACKFLOODING FROM THE RIVER VIA DISPLACED BACKCHANNEL

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 129R Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
12/3/97		0	360	0	0	4320

FISH UTILIZATION

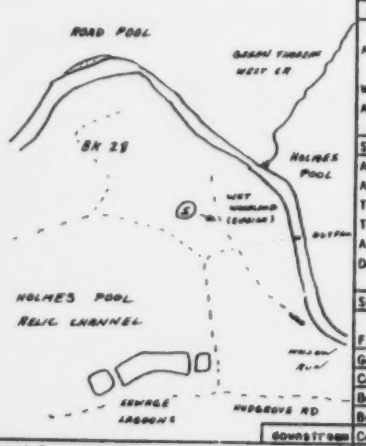
None, although there is chance of overwintering coho at the confluence with Dispersed Pool backchannel

ENHANCEMENT ASSESSMENT

There are no evident enhancement opportunities

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 130R NTS Map: 92 C/16
Site Location: CENTRAL
87 | 6 | 11 Time: Agency: Crew: TB
yr mo day
Air Photo Location No.: 87009 flight line 004, 007 photo nos.
Weather: CLOUDY, WARM Air Temp. °C: 24
Access: MUDGROVE RD, GR 37 Water Temp. °C: 1
LOGGING RD OR SEWER PUMPING RD

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	11	Total Pool (%)	100
Avg. Wetted Width (m)	.05	Total Riffle (%)	
Total Length (m)	360	Total Run (%)	
Total Wetted Area (m^2)	200	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	15	Turbidity (cm)	
		Total	100%

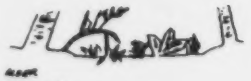
SUBSTRATE COMPOSITION

	%
Fines	7
Gravel	2
Cobbles	1
Boulders	0
Bedrock	0

Comments:

Compaction Nil L M(H)

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	
Mainstem Discharge (m^3/sec)	20

Gradient Profile:
Longitudinal)

Comments:

WETTED BY

1 BACKFLOODING

2 WINTER WATER TABLE

3 OCCASIONAL LIGHT SPILL FROM THE MAINSTEM

4 UPWELLING IN LOWER 50 M

BECOMES DRY BY MID-APRIL IN MOST YEARS

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 130R

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
11/6/87	20	0	360	.05	200	3960
2/5/87	9.49	0		.037	180	
19/9/87	7			.037	150	

FISH UTILIZATION

Possibility of overwintering coho light spawning and summer rearing in lower 50 m where upwelling provides summer wetting and run is patchy gravel

ENHANCEMENT ASSESSMENT

No opportunities apparent. Excavation of an inpiration pool would not provide permanent flow

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW

upstream

Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 130R NTS Map: 92C/16
Site Location: NEAR HEAD
17 | 6 | 11 (yr mo day) Time: Agency: Crew: TB
Air Photo Location No.: 91009 flight line; 006 - 007 photo nos.
Weather: CLOUDY, WARM Air Temp. °C: 24
Access: HUDSONS RD., SR 29 Water Temp. °C:
CROSSING MAP

SIDECHANNEL SUMMARY

Avg. Chan. Width (m)	10	Total Pool (%)	NA
Avg. Wetted Width (m)	0	Total Riffle (%)	
Total Length (m)	250	Total Run (%)	
Total Wetted Area (m^2)	0	Total Glide (%)	
Ave. Slope (%)	.01	Total Slough (%)	
Debris (%)	10	Turbidity (cm)	
		Total	100%

SUBSTRATE COMPOSITION

	%
Fines	8
Gravel	2
Cobbles	0
Boulders	0
Bedrock	0

Comments: GRAVEL UNDERNEATH

downstream: Compaction Hill L M(H)

Sidechannel Cross-Section (downstream view)

Sidechannel Discharge Summary

Method:	NA
Channel Width (m)	
Wetted Width (m)	
Avg. Depth (cm)	
Wetted X-Sec Area (m^2)	
Avg. Velocity (m/sec)	
Flow (m^3/sec)	0
Mainstem Discharge (m^3/sec)	20

Gradient Profile: Longitudinal

Comments:

WETTED BY WINTER WATER TABLE WHICH PRODUCES A SLIGHT FLOW .064 CMS (2.25 CFS) AT CMS IN THE MAINSTEM. COHO WINTERING CONDITIONS ARE EXCELLENT BUT NONE HAVE BEEN SEEN BECOMES INT BY EARLY TO MID-APRIL IN MOST YEARS

SIDE CHANNEL ASSESSMENT SUMMARY

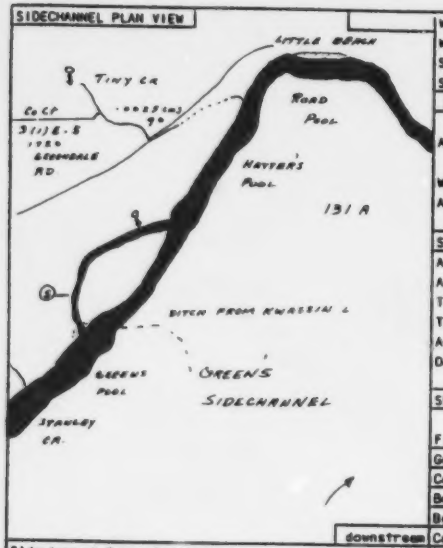
Sidechannel No. 130R NEAR HEAD / Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
9/3/97		.064	250	10	2500	2500
11/6/97		0		0	0	
24/5/97	20	0		0	0	

FISH UTILIZATION: None. Winter conditions are conducive to coho rearing but the channel dries early - long before smoltification

ENHANCEMENT ASSESSMENT: No practical opportunities are evident

SIDECHANNEL ASSESSMENT FORM

SIDECHANNEL PLAN VIEW



Watershed Name: COWICHAN
Watershed Code:
Sidechannel No.: 131A NTS Map: 92 C/16
Site Location: 40M BELOW INLET
87 | 9 | 2 Time: ____ Agency: ____ Crew: TB
yr mo day
Air Photo Location No.: BC 81009 flight line: 006, 007 photo nos.
Weather: CLEAR, WARM Air Temp. °C: 24
Access: GREENDALE RD, GREENS DRIVEWAY Water Temp. °C: 21.5

SIDECHANNEL SUMMARY

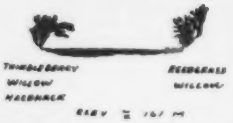
Avg. Chan. Width (m)	8	Total Pool (%)	30
Avg. Wetted Width (m)	7	Total Riffle (%)	51
Total Length (m)	237	Total Run (%)	
Total Wetted Area (m^2)	1659	Total Glide (%)	19
Ave. Slope (%)	.5	Total Slough (%)	
Debris (%)	0	Turbidity (cm)	NIL
		Total	100%

SUBSTRATE COMPOSITION

	%	Comments:
Fines	1	
Gravel	7	
Cobbles	1	
Boulders	1	
Bedrock	0	

downstream Compaction NIL (L) M H

Sidechannel Cross-Section
(downstream view)



Sidechannel Discharge Summary

Method:	FLOAT
Channel Width (m)	6.7
Wetted Width (m)	6.7
Avg. Depth (cm)	.16
Wetted X-Sec Area (m^2)	1.072
Avg. Velocity (m/sec)	.143
Flow (m^3/sec)	.153 (1) × 1.288 = 1.38 cfs
Mainstem Discharge (m^3/sec)	7.98

Gradient Profile:
Longitudinal)

Comments:

THE CHANNEL IS CUT OFF BY THE BERM IN SOME YEARS. WHEN IT HAPPENS, THE GREENS LOWER THE BERM BECAUSE THE CHANNEL IS THEIR WATER SUPPLY. BERM ELEVATION VARIES SOMEWHAT BETWEEN YEARS BUT IS EASILY MODIFIED DUE TO THE FINE NATURE OF ITS GRAVEL

WETTED BY THE RIVER AND A SPRING 40 M ABOVE THE OUTLET

SIDE CHANNEL ASSESSMENT SUMMARY

Sidechannel No. 131A

Day/Month/Year	Mainstream Discharge (m^3)	Sidechannel Discharge (m^3)	Total Length (m)	Average Wetted Width (m^2)	Total Wetted Area (m^2)	Optimum
2/8/87	7.98	.1325	237	7	1659	1996
10/8/87	4.48	.00021	237	4	948	
3/4/87	44	5.12	237	8	1896	
5/8/87	30	2.1	237	8	1896	
24/5/87	19	.93	237	8	1896	

FISH UTILIZATION

Coho, steelhead and cutthroat fry are present as summer residents. The channel flows swiftly in fall - winter and has doubtful winter habitat capability. Spawning has not been reported except for steelhead in some years.

ENHANCEMENT ASSESSMENT

Creation of a larger, more stable berm and increasing channel complexity - cover would enhance rearing value.

APPENDIX

COWICHAN LAKE STORAGE

British Columbia Forest Products Limited is authorized by C.L.'s 23085 and 29542, to store water in and to regulate the outflow of Cowichan Lake.

The licensed quantity is 49,700 acre feet (6.13×10^7 m^3) which is controlled over a live storage range of about 1 meter (full supply level is 104.68 feet and the zero storage level is 101.50 feet; elevations refer to an assumed local datum; 104.68 feet is 532.72 feet G.S.C. datum).

The control structure consists of the following items, listed in order from left bank to right bank.

1) boat lock structure - allows boat passage between the lake and the river.
2) overflow weir - allows passage of winter flood flows, at water levels above 104.68 feet.
3) an island, separating the weir from the control structure.
4) four control gates - allows control of outflow, and thus lake level.
5) fishway - allows free passage of fish between the lake and river.

Normally operation of the control structure commences around mid April and continues to mid October, at which time the gates and boat lock are left in an open position to allow free passage of water.

The following provisional operating rules have been used since 1974:

1. The control of outflow through the dam may commence when the lake level reaches 104.68 feet on the lake gauge, corresponding to elevation 532.72 feet Geological Survey of Canada datum, on its falling stage, following the winter high water season in each year.

2. After control commences the licensee shall maintain a minimum outflow from the lake of 250 cubic feet per second except when release of a lesser outflow is approved in writing by the Comptroller of Water Rights. The storage in the lake shall be regulated so that its level does not exceed the following gauge readings on the dates specified except when higher levels occur under unregulated conditions:

June 30	104.4 feet
August 5	103.5 feet
September 15	102.5 feet
October 15	101.5 feet

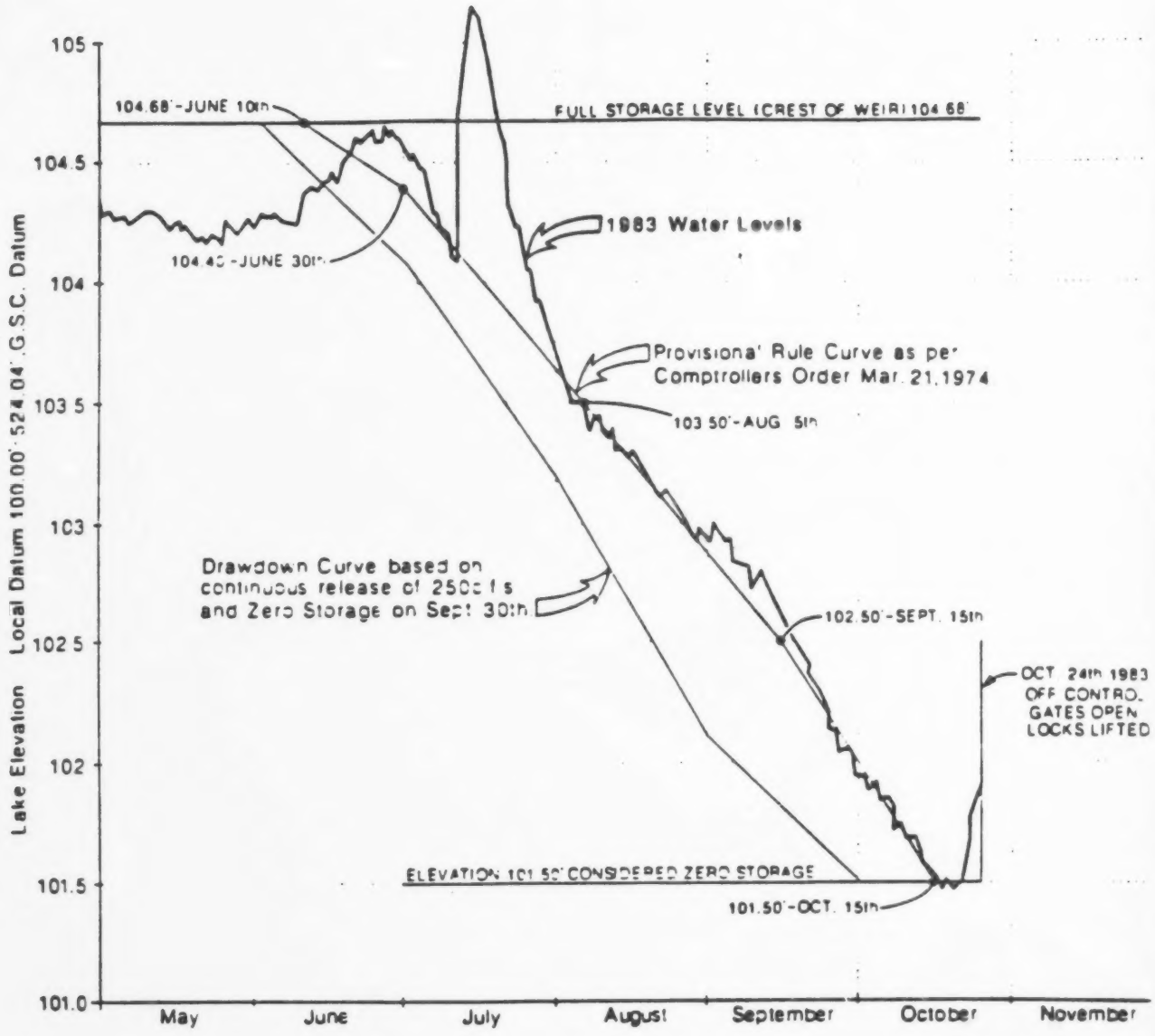
3. After October 15 the gates of the dam shall be fully opened until commencement of the next following operating season.

4. Regulation of storage releases must be controlled so that fluctuations in river level as indicated on Water Survey of Canada Gauge No. 8H A2 located at the highway bridge at Cowichan Lake Village are not greater than 0.25 foot during any adjustment or in excess of 0.50 foot in any 24 hour period, except when outflow from the lake is less than 750 cubic feet per second the licensee, so far as is practicable, shall control further reductions in flow so that lowering of the water level at the said gauge does not exceed 0.10 foot at any one time.

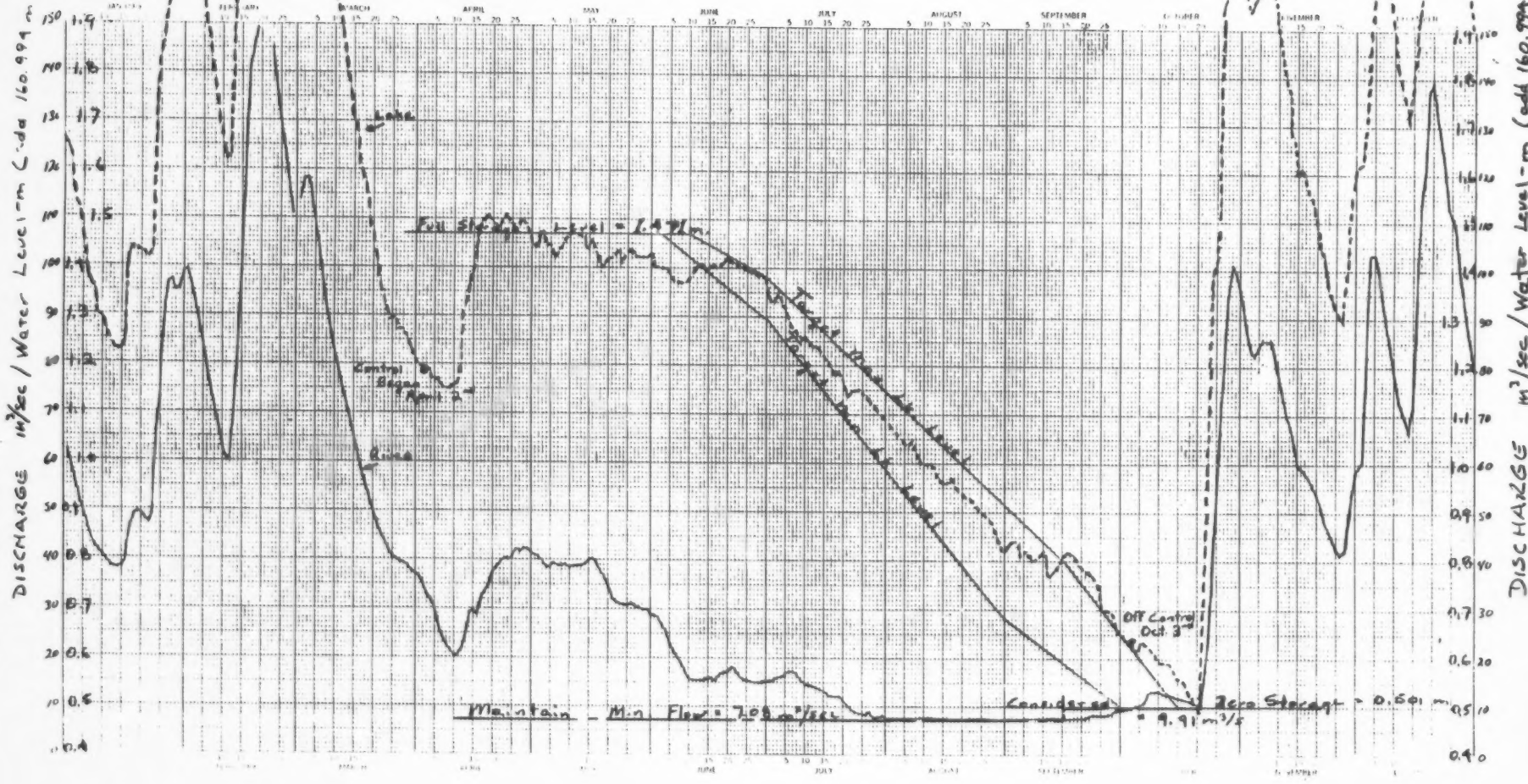
The provisional rule curve is shown attached. Also shown is the 1983 water level data as an example operating year. The lake discharges for this same period of record are also attached to demonstrate typical operations.

1983 OPERATION

DATE	WATER LEVEL (ft.) LAKE	RIVER	FLOW c.f.s.	m^3/s	COMMENTS
15 April	104.46	101.23	1880	53.2	Control commences
20 April	104.20	100.64	660	18.7	Lake level below f.s.l.
30 April	104.30	100.61	610	17.3	
10 May	104.30	100.61	610	17.3	
20 May	104.18	100.52	485	13.7	
30 May	104.27	100.32	265	7.50	
10 June	104.39	100.32	265	7.50	
20 June	104.62	100.33	275	7.79	
30 June	104.59	100.52	485	13.7	
10 July	104.15	100.55	540	15.3	10-14 lake level rising
14 July	105.14	101.18	1780	50.4	sharply maximum lake level
20 July	104.57	101.07	1520	43.0	
30 July	103.77	100.68	725	20.5	
10 August	103.39	100.30	250	7.08	
20 August	103.17	100.30	250	7.08	
30 August	102.98	100.30	250	7.08	
10 September	102.77	100.48	430	12.2	
20 September	102.40	100.54	510	14.4	
30 September	101.97	100.40	345	9.77	
10 October	101.68	100.36	305	8.64	
15 October	101.51	100.32	265	7.50	
23 October	101.86	100.46	405	11.5	Control ends.



Cowichan Lake Storage Provisional Rule Curve and 1983 Water Levels.

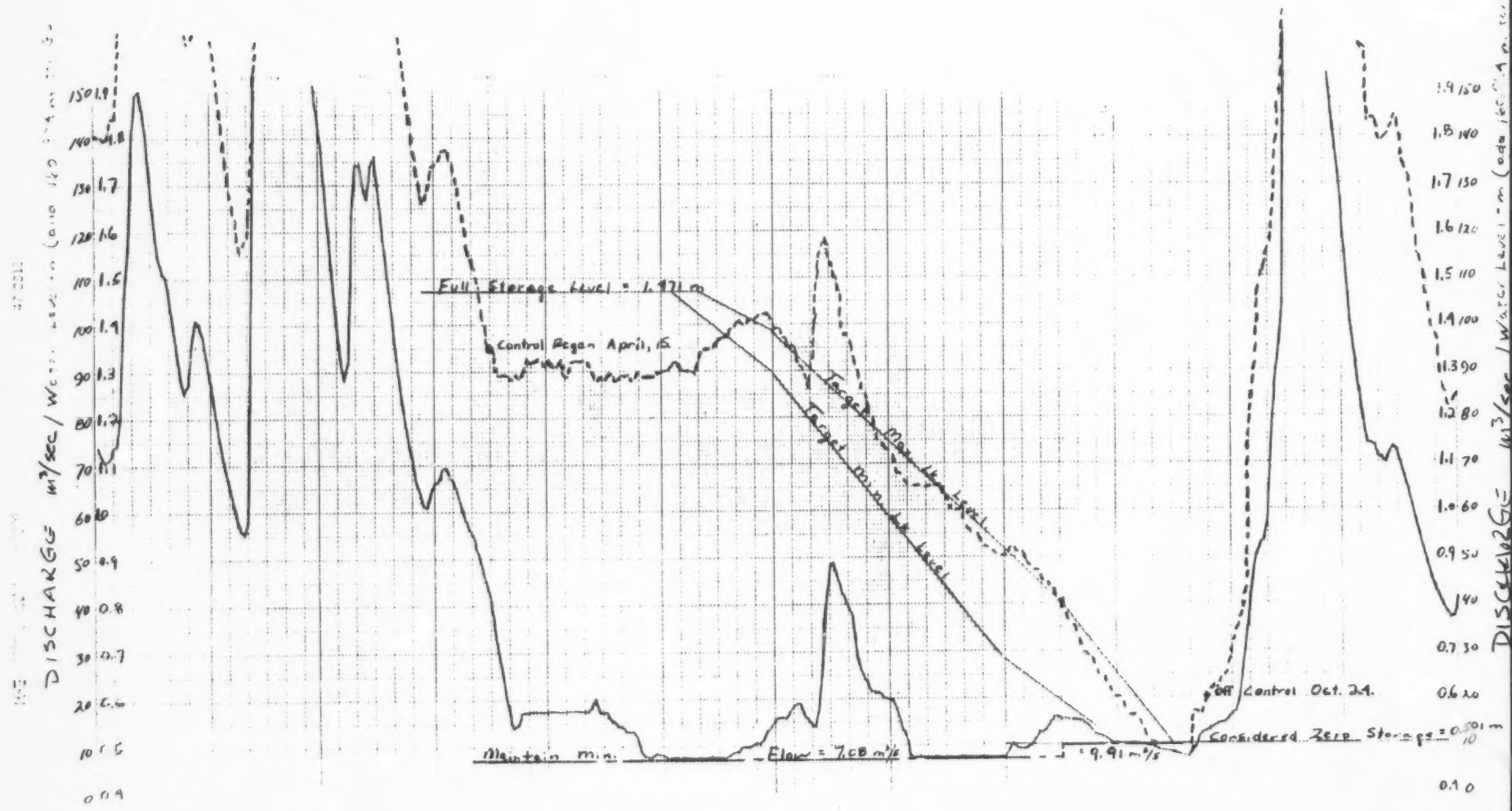


47 2813

K+E 1 YEAR BY DAYS X 100 DIVISIONS

COWICHAN RIVER at Lake Cowichan
08HA002

7.08 m³/sec = 250 cfs
9.91 " = 350 cfs


DISCHARGE m³/sec / Water Level - m (datum IGLD 1985)
Full Storage Level = 1.971 m
Control Began April, 15
Target Max. Level
Target Min. Level
Off Control Oct. 24.
Considered Zero Storage = 0.501 m
Maintain min. Flow = 7.08 m³/s
= 9.91 m³/s
DISCHARGE m³/sec / Water Level - m (datum IGLD 1985)

1983

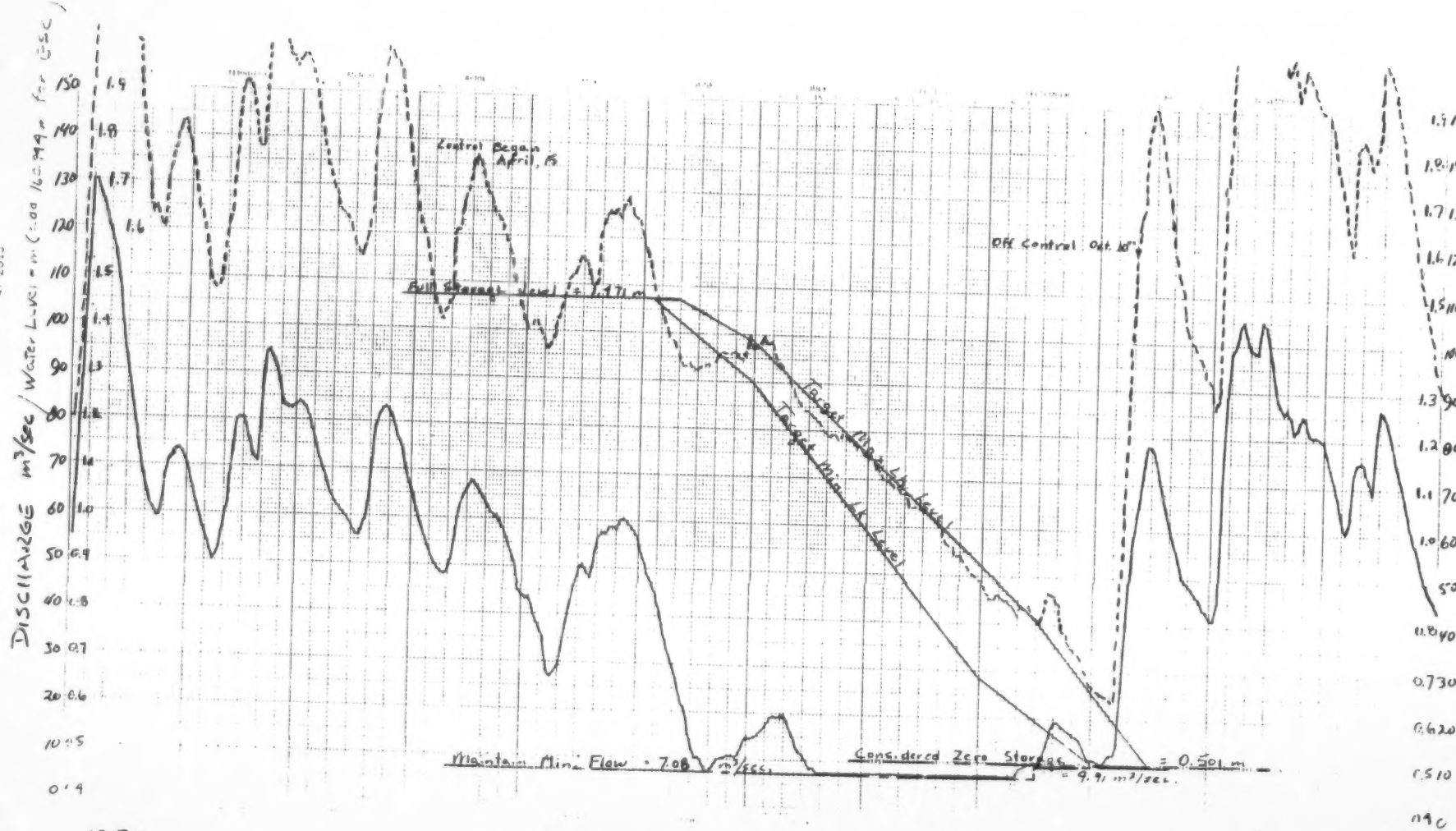
COWICHAN RIVER at Lake Cowichan

08HA002

7.08 m³/sec = 250 cfs

9.91 " = 350 "

1983

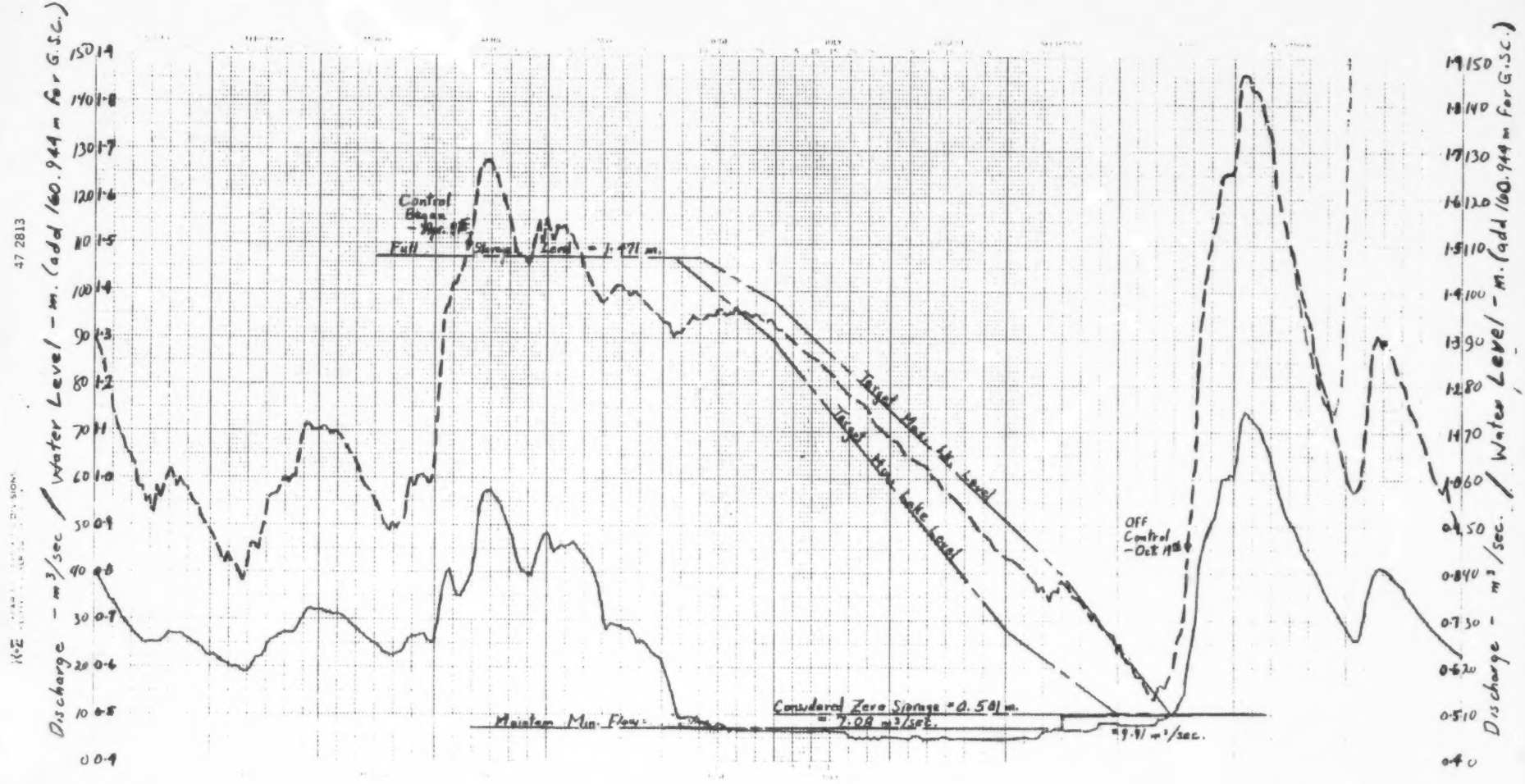

Discharge m³/sec / Water Level - m (1.00 to 1.99 m for 0.5 c.)
Control Began April 15
Full Storage Level = 1.71 m
Off Control Oct 10
Target Maximum Level
Target Minimum Level
Maintain Min. Flow - 7.08 m³/sec.
Considered Zero Storage = 0.501 m = 9.91 m³/sec.
1984
1984
Discharge - m³/sec. Water Level - m (1.00 to 1.99 m. to 0.5 c.)

COQUICHAN RIVER at Lake Coquichan

08HA002

7.08 m³/sec = 250 cfs

9.91 " = 350 "


Discharge - m³/sec / Water Level - m. (add 160.944 m for G.S.C.)
Control Began - Mar. 9th
Full Storage Level = 1.471 m.
Target Maximum Level
Target Minimum Lake Level
OFF Control - Oct 19th
Considered Zero Storage = 0.581 m. = 7.08 m³/sec.
Maintain Min. Flow:
9.91 m³/sec.
1985
1985

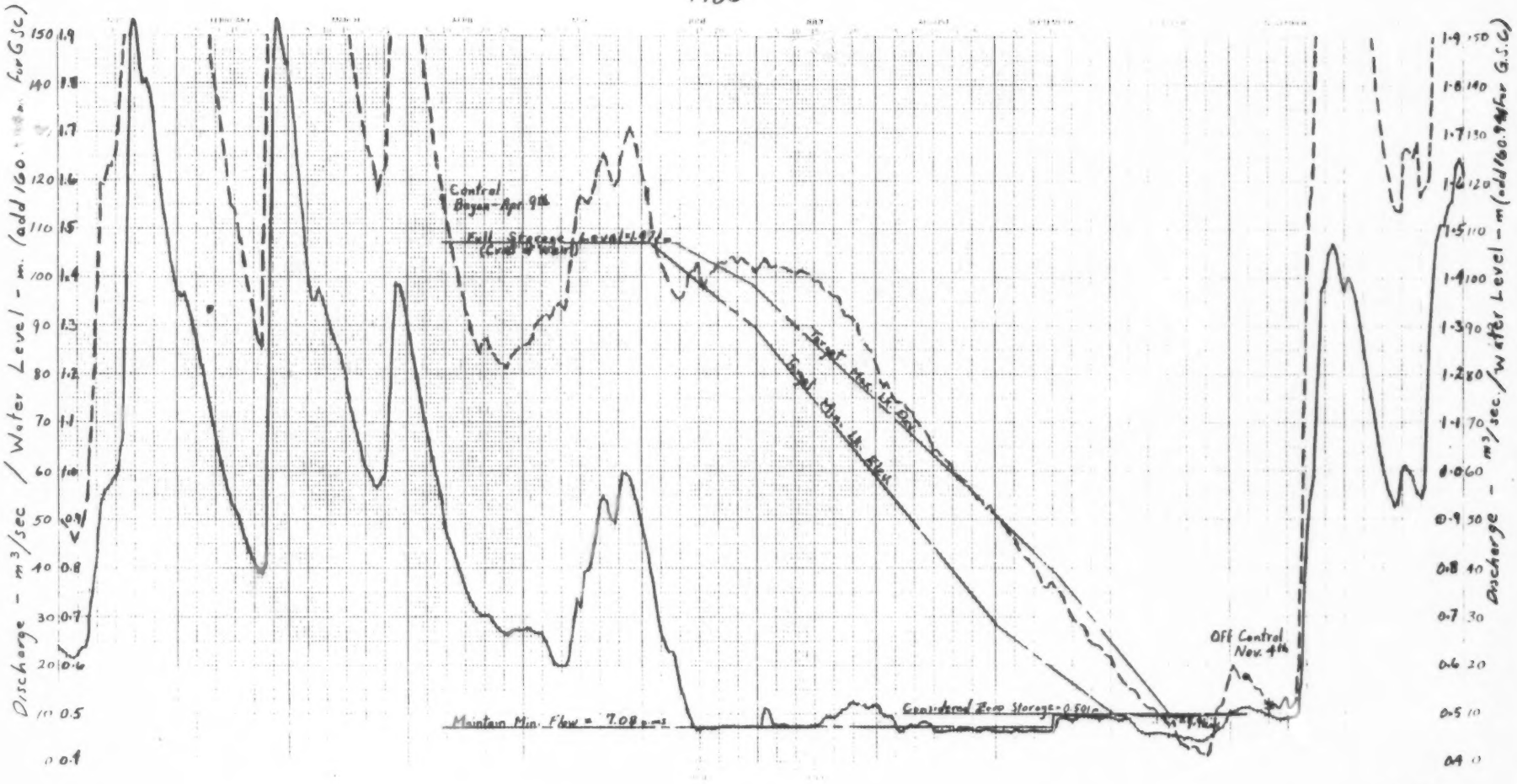
COWICHAN RIVER at Lake Cowichan

08HA002

7.08 m³/sec = 250 cfs

9.91 " = 350 "

1986


Discharge - m³/sec / Water Level - m. (add 160.___ for G.S.C.)
Discharge - m³/sec. / Water Level - m (add 160.794 for G.S.C.)
Control Began - Apr 9th
Full Storage Level = 1.97 m (Crest of Weir)
Target max. 1.97 Dec
Target min. 1.4 Aug
Off Control Nov. 4th
Maintain Min. Flow = 7.08 m³/s
Conservation Zone Storage = 0.501 m

1986

1986

COWICHAN RIVER at Lake Cowichan

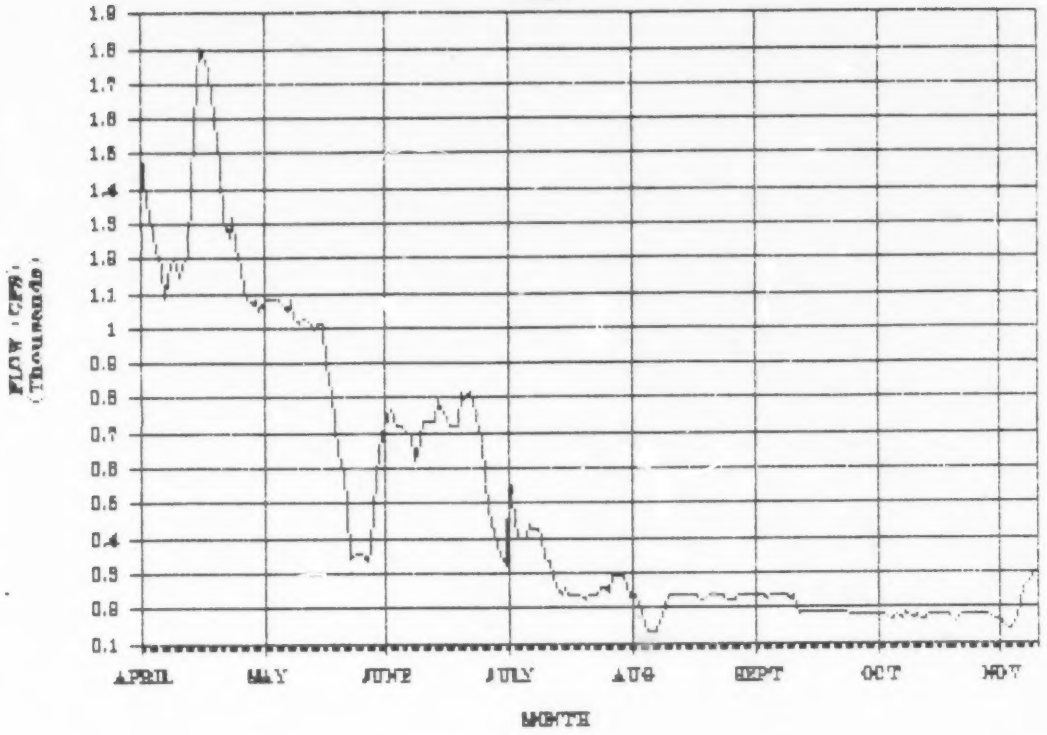
08 HA 002

7.08 m³/sec = 250 c/s

9.91 " = 350 "

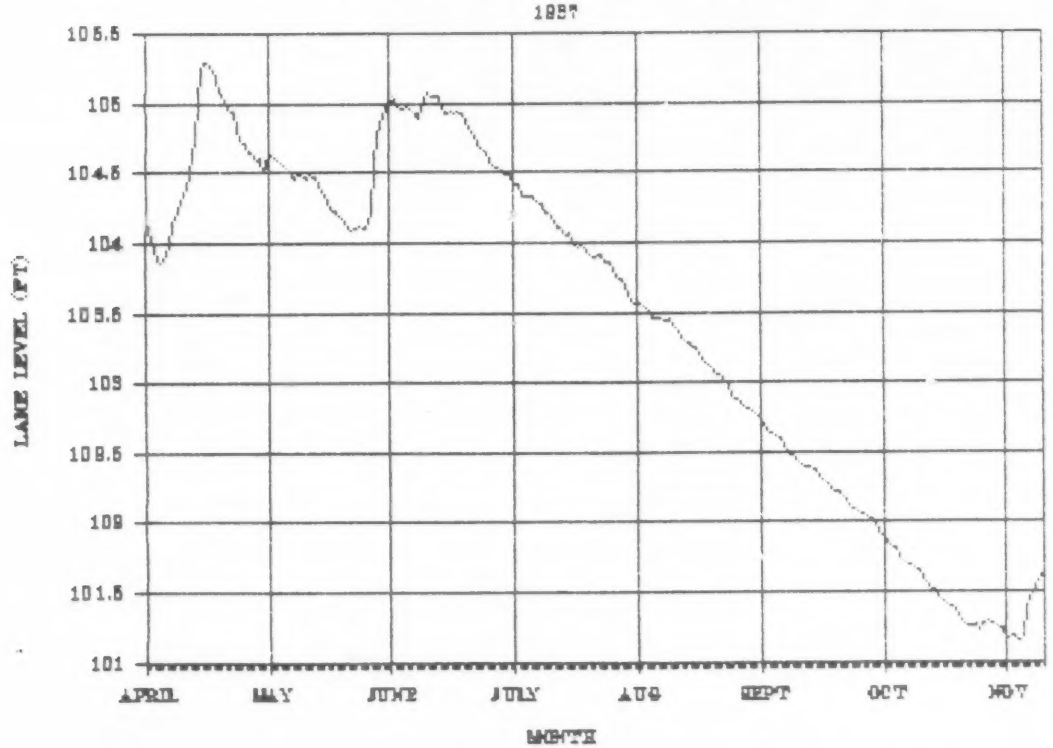
COWICHAN LAKE WEIR

1987



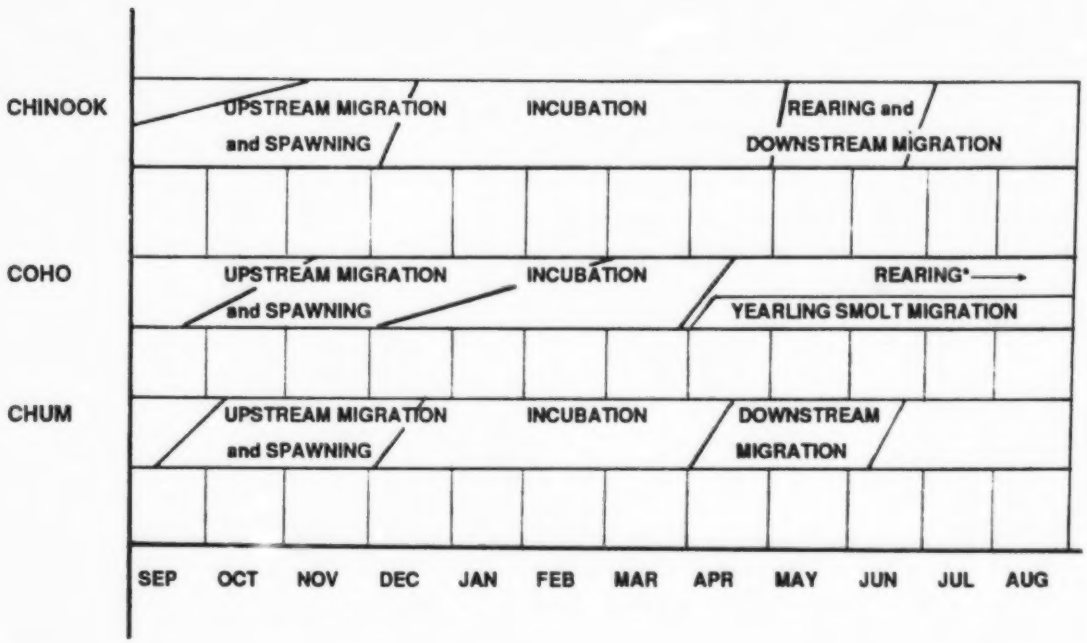
COWICHAN LAKE WEIR

1987



Appendix 4

FRESHWATER LIFE CYCLES FOR COWICHAN RIVER SALMON



* YEAR ROUND RESIDENCE

Fisheries Branch South Coast Division
3225 Stephenson Point Road, Nanaimo, B.C. V9T 1K3

Cowichan River Assessment
Department of Fisheries & Oceans